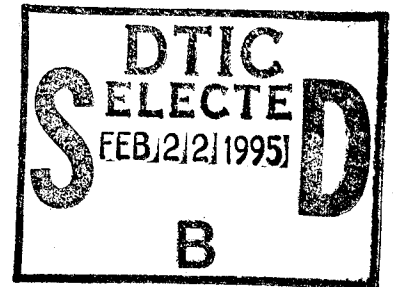# AIR FORCE BASE SUPPLY LOGISTICS SUPPORT METRICS AND SOFTWARE MANIPULATION TOOL ANALYSIS

Research into the metrics used by supply management personnel and an evaluation of Knowledge-Based Decision Support tools

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Prepared By:
Bill Shaw, *Senior Logistics Analyst*
Larry Reagan, *Senior Systems Engineer*
Robert Monahan, *Staff Engineer*
Dynamics Research Corporation
1755 Jefferson Davis Hwy, Suite 802
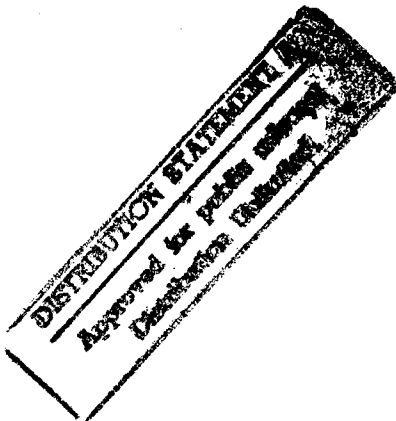**Arlington, VA 22202**

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13. ABSTRACT *(Maximum 200 words)*

DRC researched the logistics support metrics and studied the applicability of Decision Support System (DSS) technology for Air Force base-level supply operations. The DSS supports The Chief of Supply (COS) and other senior supply operations managers. DRC researched, interviewed, surveyed, and gathered data from Air Force supply professionals. This information assists future efforts to develop a DSS. Second, DRC reviewed available Commercial-Off-The-Shelf (COTS) software packages for applicability in DSS.

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EXECUTIVE SUMMARY

Air Force Standard Systems Center (SSC) tasked Dynamics Research Corporation (DRC) to research the logistics support metrics and study the applicability of Decision Support System (DSS) technology for Air Force base-level supply operations. The DSS was to support the Chief of Supply (COS) and other senior supply operations managers. SSC wanted two specific areas investigated. First, DRC would research, interview, survey, and gather information from Air Force supply professionals. This encapsulated information assists future efforts to develop a DSS. Second, DRC would review available Commercial-Off-The-Shelf (COTS) software packages for applicability in DSS.

The results of this study are focused in two areas. Section one is the results of the knowledge gathering activity. DRC gathered information on what performance indicators are the most critical to assessing the health of a supply operation and the role of senior supply operations managers. We concentrated on Stockage Effectiveness to demonstrate the use of the expert knowledge in a decision support system. The second section focuses on the COTS tools necessary to develop a system that is reasonably priced, deployable, and functional on a PC (Intel 486 platform).

The knowledge survey found evidence of specific approaches to maintaining Stockage Effectiveness used by masters in the field. These approaches are documented and integrated into a prototype demonstration of the DSS software. The prototype uses a combination of COTS tools to show proof of concept. The combination of available technology and manpower downsizing in the supply career field make this type of system a necessity for future successful operations.

This study recommends a specific combination of software for development of a Chief of Supply (COS) Decision Support System. It also documents the findings of the knowledge surveys, highlighting the critical areas of concern for Chiefs of Supply. Although the goal of this effort is to develop an understanding for a system to be used at the base level, during the study many higher level (MAJCOM & HQAF) personnel suggested other uses for the proof of concept system. These other uses are not addressed here but are obvious considerations for future studies.

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SECTION 1 - INTRODUCTION

1.1 PURPOSE
This report records the results of DRC's research into the logistic support metrics used by supply management personnel and the applicability of decision support system (DSS) technology to Air Force supply operations.

1.2 BACKGROUND
The United States Air Force, Air National Guard and Air Force Reserves operate over 200 retail supply operations at Air Force bases/activities world-wide. Each of these operations is a self-contained accounting unit that orders, receives, stocks, issues and redistributes various types of materiel (commodities) in support of the entire range of Air Force weapon systems. Each supply activity operates under essentially the same procedures. The magnitude of the operation and the commodities managed are the primary differences.

These supply operations, in spite of standardization, tend to be fairly complex organizations to lead and manage. Depending on the size of the supply operation the active force supply operations are normally run by a military officer in the grade of Captain to Lt Colonel. This person is referred to as the Chief of Supply (COS) and as the Supply Squadron Commander where appropriate. The COS normally has a civilian assistant and a staff of 3-6 officers and officer grade civilians to assist in running the operation. However, the duties of the COS and the staff are numerous and at times overwhelming. In addition, the Air Force is moving toward a "Logistics" career field vice the specialties of supply, maintenance, transportation, etc. As this becomes reality the officers assigned to manage supply operations are going to have less detailed supply knowledge and experience.

Therefore, there is a need to give the COS and the key supply staff an automated tool to gather and display critical information to assist them in the performance of their tasks. There is also a need to provide automated decision tools and artificial intelligence to perform routine, repetitive tasks freeing managers and technicians to deal with more important issues. Finally, there is a need to capture the knowledge of the current cadre of trained supply professionals and build that knowledge into the DSS expert help and artificial intelligence.

1.3 OBJECTIVES
Understanding this challenge that faces the supply community, the Air Force Standard Systems Center (SSC) Supply Division, with the endorsement of the Headquarters Air Force Supply/Fuels Policy Division (HQ USAF/LGSP) tasked Dynamics Research Corporation (DRC) to perform an initial evaluation of the feasibility of building a DSS for base supply managers. Included in the task was a desire to begin capturing "supply knowledge" from active duty and retired supply professionals for inclusion in an "expert help" DSS capability. The objectives of this tasking were:

1.   Provide maximum flexibility for cross-training logistics officers into supply from other disciplines such as maintenance and transportation by providing expert help and artificial intelligence to base supply management.
2.   Facilitate maximum "management by exception" by automating the task of reviewing critical indicators to see what is out of tolerance.
3.   Record for future use the accumulated knowledge of currently trained and experienced supply professionals.

1.4 SYSTEM DESCRIPTION
The Air Force Base Supply Decision Support System, called COS-Mate in this study, envisions a PC-based, client-server arrangement at each retail supply operation. The system will run on an 80386 processor, but a 80486 is preferred. For maximum effectiveness the supply operation or the wing/base

should have a local area network (LAN) in place. The local server pulls the required data from the various sources on a predetermined regular basis and stores it until requested by an authorized user. At that time, the server displays the data using graphical user interface (GUI) screens. The system allows management by exception by using "acceptable ranges" to highlight problem and potential problem areas to management. The server also stores historical data unique to the supply operation. Figure 1.4-1 describes the system architecture.
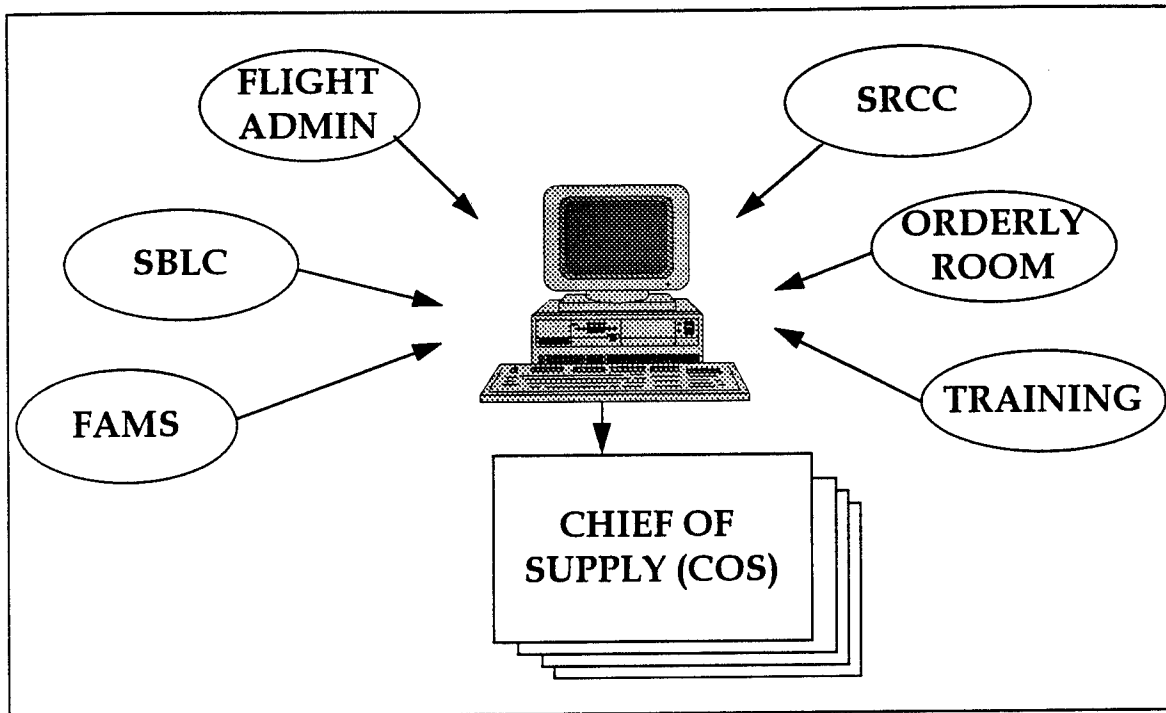
Figure 1.4-1   The COS-Mate System Architecture

COS-Mate uses available COTS software integrated to provide the required data. It incorporates expert help in a hypertext environment. The system will be available to key supply operations personnel and, perhaps, selected customers. Considerable "user tailoring" capability is provided due to the wide variations in supported missions and systems. The system incorporates the electronic AFM 67-1 and provides immediate access to required references through hypertext. The DSS incorporates expert help and artificial intelligence and automates much of the research required to investigate problems. The system is complaint with human factor standards. System maintenance and updating will be organic.

1.5   ORGANIZATION

The report contains four sections. Section 1.0 provides background information and describes the general approach used to satisfy the requirements of the Air Force Base Supply DSS program, Phase I. Specifically these requirements were:

    A. Begin the development of a repository of supply knowledge through interviews and surveys of selected supply professionals.

    B. Research, review and analyze the COTS software available to develop a DSS.

    C. Develop a prototype demonstration of a base supply DSS using COTS software reviewed during this phase.

Section 2.0 presents the results of the research. It is divided into three parts; a summary and evaluation of the knowledge survey; the results of the COTS software evaluations; and the evaluation of the DSS

concept using a prototype demonstration model. Section 3.0 presents the conclusions of our research and evaluation. Section 4.0 contains our recommendations.

1.6 APPROACH

The Air Force desires to field an operational DSS at all base level supply operations. The development task has been tentatively divided into two phases for manageability. Phase I, the effort covered by this report, includes the concept evaluation, the COTS evaluation and the knowledge survey. Phase II, yet to be funded, includes the continued development and installation at locations specified by the Air Force. Phase II can be further sub-divided to facilitate future development efforts, if required. The operational deployment would follow Phase II.

The overall approach to the entire effort follows a "continuous prototyping" concept which will:

1. Research critical knowledge and supply metric information.
2. Prove the concept through development of the demonstration prototype,
3. Proceed with prototyping of additional screens and expert help,
4. Install the system at several selected locations to begin gathering and analyzing user input,
5. Reassess the initial concept based on feedback,
6. Baseline and field the system at all Air Force base-level supply operations.

This effort completed steps 1 and 2. Expert knowledge was gathered and applied to known supply metrics. A proof-of-concept system was developed which demonstrated the value of having a base-level DSS. The long-range Air Force goal is to field the DSS as one of the supply system modules in the Base Level System Modernization (BLSM) initiative.

SECTION 2 - PHASE I RESULTS

2.1   KNOWLEDGE SURVEY

2.1.1   Approach

The knowledge survey's focus was to capture supply knowledge from a cross-section of selected supply professionals in order to develop an expert help capability for the DSS. We decided to reach as many people as possible by personal interview and to contact an additional number through the use of a mailed questionnaire. (Appendices 1 and 2). Our objective in this initial effort was to gather as much general knowledge as possible and specific knowledge on a small number of subjects that would be used to demonstrate the concept. We chose stockage and issue effectiveness as areas where we would research specific knowledge.

We contacted a broad cross-section of supply professionals; military and civilian, officer and enlisted, active duty and retired, representing a number of different Air Force commands and units. To minimize travel costs, we chose most of our interview subjects from the HQ USAF Supply/Fuels Policy Division, the Air Combat Command (ACC) Supply Division and the Standard Systems Center (SSC) Supply Division staffs. A summary of the personnel interviewed is at Appendix 3. For the surveys, we reached additional retired people and some officers currently holding a Chief of Supply position. A summary of the surveys returned is at Appendix 4.[1]

2.1.2   Findings

The results of the surveys and interviews are consolidated into several documents. The identity of specific respondents has been removed and results are reported by a respondent number (1-23). The number of respondents to each question varies. This is because there were different questions on two surveys depending on the background of the person. In addition, interviews did not always produce answers to all of the questions on the surveys. Finally, survey respondents did not always answer every question. However, sufficient responses were obtained to each question to form a basis for the DSS knowledge system. The following paragraphs summarize the findings. Section 2.1.2.1 covers the subjective responses to questions 1, 2, 3, 4, 5, 9, and 10. Section 2.1.2.2 covers the objective responses to questions 6, 7, and 8. A complete record of all responses is in Appendix 5.

2.1.2.1   Subjective Responses

Question #1 - State, in your own words, the Goal of a Supply Squadron (and the Chief of Supply).

The most frequent response was concerning supply having parts needed by the wing's primary weapon systems. Responses included:

- "having the right part",
- "parts to the crew chief in less than 15 minutes",
- "100% per cent on hand parts for aircraft",
- "having the parts needed for wartime".

The next most frequently mentioned goal concerned customer service (providing quality service, 100% customer satisfaction). Other responses included "support to the wing mission", "most efficient supply squadron in the AF", "training", "accountability and integrity".

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[1] Note that 18 interviews were performed and 12 surveys completed, however, the total respondents was 23. This is because 7 of the interviewees also completed surveys.

Question #2 - How would you describe the most important oojective of the COS?

The most frequent responses involved "supporting and understanding the wing mission" and looking out for your squadron ("educate the squadron", and "take care of the people"). Other responses included: "lowest Mission Capability (MICAP) rates", "win Daedalian", "understand supply metrics", and "integrate the supply squadron into the wing mission".

Question #3 - Describe in your own words the role of the Chief of Supply.

Leadership and guidance were important. The most frequent responses concerned resource management - people, equipment, money. The responses mentioned "right mix of resources", "balance resources", "insure the squadron has resources", "key personnel moves". However, two other areas received considerable attention; first, a facilitator and guide and second, the person who must provide the encouragement for new ideas and the squadron vision.

Questions #4&5 - Describe in your own words a typical day for the COS and the supply squadron senior leadership.

The most frequent responses involved the COS getting out and visiting the squadron and the customers. Typical responses included:

- "it is imperative that these folks spend the majority of their day in the elements, being visible and having a feel for the pulse of the squadron",
- "visit as many elements as possible",
- "visit customers for feedback", and
- "meet with contracting and customers".

Question #9 - Describe any other situation/challenge/problem you experienced, what caused it and what steps you took to successfully correct it? What did you learn from this experience?

Question #10 - Please provide any advice, "tips", things to avoid or ideas that worked for you.

The responses to these questions have been merged and are too numerous to summarize. They are provided as Appendix 6.

2.1.2.2   Objective Responses

Question #6 - What are the most critical performance indicators supply account management should track daily? (Or more frequently than monthly)

The most important indicator is the status of the wing weapon systems, particularly as measured by the Total Not Mission Capable - Supply (TNMCS) rates. A close second is the Mission Capability (MICAP) status and analysis of all MICAP requisitions. Other indicators, or indicator groups in order of importance are:

- Computer status (regional mainframe, squadron terminals/PCs)
- Delinquent documents
- Reparable Support Division (RSD)/Depot Level Reparables (DLR) status (float, not reparable this station (NRTS), due-in from maintenance (DIFM) >60 days)
- Status of outgoing requisitions and status

- Total asset position of critical items (Mobile Readiness Spares Package (MRSP) warstoppers, etc)
- Readiness Spares Package (RSP) status (fill rate, deployed, reps from deployment)
- Stock fund and Operations and Maintenance (O&M) funds status
- Repair cycle status (DIFM, awaiting parts (AWP))
- Critical resources (hot pits, hydrants, refuelers, etc)
- Delinquent rejects
- Suspenses
- Issue/stockage effectiveness (by weapon system)
- Warehouse refusals
- Fuels flightline operations (lates, average response time)
- Reverse posts
- Squadron readiness
- Deployed personnel
- Parts store pick up times
- Squadron equipment status

Question #7 - What performance indicators should the COS and the key managers review monthly?

There was no clear "winner" in this category. Several indicators received equal mention as requiring monthly attention. These are, in no particular order:

- Average response times for the month and a summary of any late refuelings.
- Issue and stockage effectiveness (overall and by weapon system)
- Status of mobility support equipment (MSE)
- Status of mobility bags and chemical warfare defense equipment (CWDE)
- Inventory management summary (accuracy, adjustment analysis)
- Stock fund summary (ratio, sales, obligation auth remaining, credit returns)
- TNMCS summary (status, rate, lateral support, etc)
- Transaction analysis (total receipts, issues, due-out releases (DOR), etc and ratios)
- Manning summary (auth/asgd/inbound/outbound/temporary duty(TDY))
- Training (mobility, supply, customer)
- RSP status
- Status of resources and training (SORTS) summary
- Releveling, follow-up, file status summary
- Squadron equipment status (forklifts, refuelers, mechanized material handling system (MMHS))
- Tracer action requests (TAR)
- Requisition followup
- Surveillances
- Deployed equipment
- Repair cycle summary (repaired this station (RTS) %, Repair times, AWP)
- Bench stock (demands by shop, overage backorders, fill rates, MICAP rate)
- Excesses

Question #8 - What other types of information did you find essential to maintaining your "feel" for the health of your operation?

There was no consensus to this question. Each respondent had something different they looked for to help accomplish this task. The responses, by respondent, can be found in Appendix 5. The responses were:

- Identify by national stock number (NSN) the item with the most frequent demands and/or backorders that cause MICAP conditions - see if this correlates with your SORTS reports.
- Receiving line status (daily walk through). Contracting interface (weekly/monthly meetings). Retail sales stockage (weekly walk through). Excess program status. Fuels status (equipment status, product balances, outstanding workorders)
- Daily consumption rates for liquid oxygen (LOX), liquid nitrogen (LIN), deicer, jet, diesel and motor gasoline (MOGAS). Equipment/facilities status. Liquid fuels maintenance (LFM) schedules.
- Weekly staff meetings - get a feel from your supervisors as compared to a personal feel from visits around the areas - find people you can trust and let them be your eyes and ears.
- I went to MICAP, Shop Service Center and POL (petroleum, oils and lubricants - another name for the Fuels Flight) everyday.
- Personal contact with the people in the squadron - but you don't get that from a PC.
- Who complained and why. If no complaints, account running O.K.
- TNMCS rate by month and weapon system for the last two years for my base and all others having the same weapon systems. Cause codes for MICAPS for last 12 months, i.e., A,B,&H for A-10, C-130, etc.

2.1.2.3 *Stockage And Issue Effectiveness*

These two indicators were researched and developed in more detail to demonstrate how expert knowledge provided by supply professionals is incorporated into the DSS. The results of that research are included as appendices seven and eight.

2.1.3 Knowledge Survey And Metric Analysis Summary

The knowledge survey produced few surprises and confirmed some long-held beliefs about what is important in managing an Air Force base-level supply operation. The cross-section of supply professionals that participated in the survey agreed that the most important thing for supply managers to worry about is the support to the primary weapon system as reflected by indicators like TNMCS and MICAP rates. There was a consensus about the role of the supply operation's senior leadership. However, the responses to the request for "tips" showed a broad range of interests and ideas. This would tend to suggest that the respondents are innovative individuals who have all received excellent training and similar guidance as they progressed through their supply careers.

The questions asked in Phase I produced the desired level of general supply knowledge, however, more information will be needed to complete the knowledge required for the DSS. We found that development of detailed expert help and rule-based decision support, such as that in the stockage effectiveness example, will require the input of selected "subject matter experts", rather than a broad range of supply managers and leaders.

The knowledge survey has a great deal of potential for the completed DSS. The knowledge survey sets the DSS apart from simply being another "How Goes It" initiative. The completed system envisions using the knowledge research to develop a "rule-based" approach that will help supply managers and customers reach informed decisions regarding specific issues. Artificial intelligence will be employed to free management from repeated, routine decisions. And the relatively new concept of "neural networks" will be explored to bring even greater enhancement to the supply manager's decision tools.

2.2 COMMERCIAL OFF THE SHELF (COTS) SOFTWARE EVALUATION

This task took a two step approach. First, we investigated a similar study DRC performed under subcontract to Modern Technologies Corporation (MTC) for the Air Force Materiel Command, SM-ALC Detachment 25. Det 25 tasked DRC to identify, evaluate, and recommend tools to serve as the User Interface in the Configuration and Data Management System at Peterson Air Force Base. Second, we evaluated tools not included in the MTC study.

We had specific criteria we evaluated the tools against. Foremost was affordability. The customer had clearly stated they wanted to organically deploy, modify, maintain, and further develop the system as required. Therefore, affordability is significant from both the development and deployment

Another significant criteria is adaptability. The customer requested the tools we used be forward adaptable. Additionally, the tools should run on a variety of platforms. Although this was not a high priority, we were asked to consider it in our evaluation of tools. Specific findings are in Appendix 9.

2.2.1 Software Requirements

The data required for a supply DSS are from a wide variety of sources. Although much of the data resides on the Standard Base Level Computer (SBLC) some of the required information did not. For example, maintenance, personnel, financial, and specific supply data exists on the SBLC. However, some maintenance data resides on other systems such as GO-81, and TICARRS. After a detailed investigation and a focus on stockage effectiveness as the first decision tree to formalize, we developed the configuration defined in Figure 2.2-1. Reports are routinely generated by the SBLC and sent over the Defense Data Network (DDN) to printers. These reports are then distributed to various users. As shown in the figure, the COS-Mate server would be a client for a similar report properly formatted to be received into a relational database. The COS-Mate client workstation would access the database on the server when necessary to gather data for its displays. This prevents long delays in processing data required for graphical displays. The data on the COS-Mate server is updated as required.

SBLC
Supply Data in Flat File
Updated Continuously

Local Server
Operates as Client from SBLC
Receives Downloaded File Daily, or as required
Performs calculations needed for COS-Mate

Client Desktop
Displays Data for User
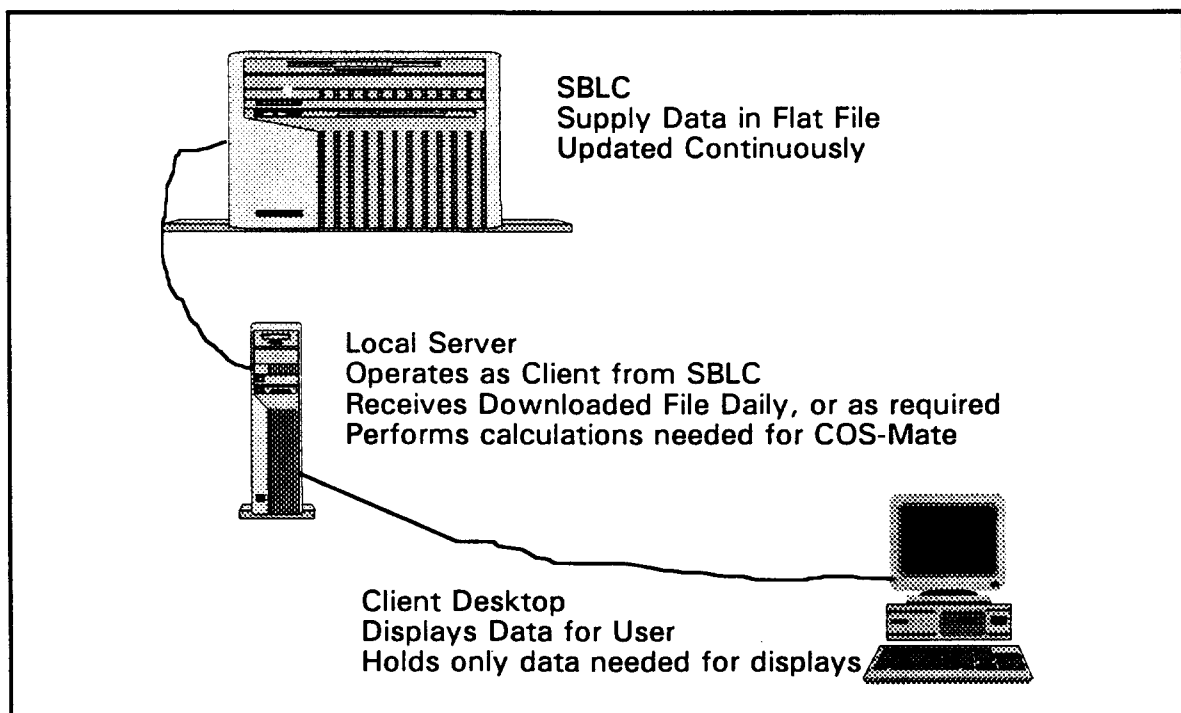**Holds only data needed for displays**

Figure 2.2-1 The COS-Mate Concept Configuration

The COS-Mate concept involves using data from a variety of sources, performing analysis on the data, and graphically displaying it in a meaningful way. Additionally, COS-Mate provides an expert help system to offer the user advise on particular scenarios. Early in the study we identified the need for three basic modules critical to a successful COS-Mate tool. These three modules are:

- Graphical User Interface
- Knowledge Library
- Background Database Processor

As the knowledge surveys were performed, several recommendations were received regarding additional modules that would be helpful. These included:

- Time Management Tool
- Note Pad
- CAD interface

We did not allow these additional desires to drive our study. We found most of the tools investigated allow easy integration of the additional capabilities. We did select a Time Management tool for integration into the demonstration prototype.

In each case, we evaluated the tools for Development Qualities, Deployment Qualities, Vender Support, and Cost. Development Qualities include:

- *The ability of a developer to perform the functions required.* Does the tool provide a capability to perform necessary functions? Does it require use of other tools?
- *Learning Curve.* Can a developer learn to use the tool easily? Are there training classes and tutorials readily available that help the developer understand the tool?
- *Integratability with other software tools.* Does it require the development of code (3GL) to integrate with other tools? Does it require intermediate tools to perform the required functions?

Deployment Qualities include:

- *Portability.* Can the tool be easily distributed and installed? Can executable versions of the tool be easily packaged?
- *Integratability.* How well does the tool fit into the Air Force Base Level System Modernization plan? How easy is it to integrate into the force now?
- *Debug capability.* If problems occur, is there a built-in method for debugging the tool?
- *Ease of 4GL programming.* If modifications are necessary once deployed, can a user easily generate those modifications? How steep is the learning curve?
- *Output capabilities.* Can the tool provide a variety of outputs including printed files, graphical displays, and data files? What is the quality of these outputs?
- *Operating Systems supported.* Does the tool support a variety of operating systems? How migratable is the tool?

Vender Support include:

- *Vender Stability.* Has the vender been in business for a long period of time? Will the vender be available to provide support in the future?

- *Quality of Documentation.* Is the documentation offered with the tool complete and sufficient? Is additional documentation (second generation) available?
- *Technical Support.* How accessible is the technical support? What is the quality of the technical support?
- *Training.* Is professional training available on the tool? If so, what is the quality of the training?

Cost includes:

- *Development packages.* For those tools that offered a developer's kit, what was the cost of the kit? What did the kit provide?
- *Runtime Licenses.* What was the cost of 30 and 100 user licenses? Are discounts offered for high quantities? What are the costs of upgrades?
- *Training.* What is the cost of any professional training offered?
- *Technical Support.* Are costs associated with technical support?

2.2.1.1   Graphical User Interface

Many tools are available to perform the Graphical User Interface (GUI). Some also perform the Background Database Processor function. These were considered when assessing tools available for COS-Mate. We identified seven tools as primary candidates for the Graphical User Interface:

- LightShip
- ObjectPlus
- Oracle CDE
- Passport
- PowerBuilder
- Team Enterprise Developer
- Uniface

In summary, Uniface and ObjectPlus advertised easy migratability to a Unix platform. We eliminated Uniface from the consideration because we could never get anyone to return our calls from any of their offices (local or corporate). Even their sales staff would not return our calls. We could not imagine offering a tool with such poor support. Especially when the professional journals indicated the learning curve for Uniface is significant. Upon further investigation of ObjectPlus, we found it is only available on a Macintosh with an IBM version coming out soon. The tool is limited in its performance abilities. It is not in the same class as the other tools. Details of the findings are outlined in Appendix 9.

LightShip and PowerBuilder became our tools of choice. Since we had experience with LightShip, we started immediately using it to develop prototype interfaces. Our hope was to identify problems early in the research. We found none. We researched PowerBuilder in parallel with the LightShip prototype. One of PowerBuilder's good features appears to be the integrated WATCOM database. With the recent Sybase buyout of PowerSoft, PowerBuilder will become a tool for extensive consideration. Symantec Team Enterprise Developer was evaluated late in the study period, but offers many key features for COS-MATE development. We will research PowerBuilder and Symantec Team Enterprise Developer more in Phase 2 of this study.

2.2.1.2 Knowledge Library

We identified two tools for consideration for the Knowledge Library. They were:

- Folio Views
- Guide

Folio Views appeared very powerful and had many of the same features as Guide. It is slightly more expensive, but the extra features more than offset the added cost. Our conclusion is that either tool would adequately serve for COS-Mate. Details of the findings are outlined in Appendix 9.

We chose to proceed with Guide simply because of experience in Guide development. During this study, Standard Systems Center selected Guide as their tool of choice for all hypertext applications. For this purpose, Guide is the Knowledge Library tool for COS-Mate. Using Guide facilitates the integration into COS-Mate of other applicable developments..

2.2.1.3 Background Database Processor

There are two strong candidates for this tool:

- Microsoft Access
- Oracle

Other PC-based databases (Foxpro, Paradox, etc) did not offer the power required for this function. Cost and size drove us to use Microsoft Access. COS-Mate requires a relational database on every Local Area Network where it is installed. Even at one copy per Air Force Base, others become very expensive. Our initial indication is COS-Mate may require a local database on the machine where it is running. Cost and memory size considerations become significant. Details of the findings are outlined in Appendix 9.

As we continue researching the capabilities of PowerBuilder, this background database may not be required. The integrated WATCOM database may be fully adequate. Additionally, discussions have started about placing a relational database on the mainframe where the original data exists. If this occurs, the software design may change eliminating the need for the local background database processor.

2.2.1.4 Software Integration

There are four integration points in the COS-Mate design. They are:

- Microsoft Windows to COS-Mate
- Mainframe to local machine database processor
- Graphical User Interface to Database Processor
- Graphical User Interface to Knowledge Library

As expected, the toughest interface was the Mainframe to local machine database processor. This provided challenges both politically and technically. Standard Systems Center helped us produce a special file created in the mainframe specifically for COS-Mate. The challenge came in gaining access to the file. We settled on a make-shift method of having the Air Force download the file to disc. We uploaded the file from the disc into the local machine. Since this was the only method we could reach agreement on, the mainframe to local machine interface was never fully realized. However, an alternate method was used at Langley AFB, in which the data was transferred from the mainframe to the local network and then into the COS-Mate system.

Our research did provide some interesting answers. The file would come to the local machine via an FTP over the DDN system. Instead of buying an FTP tool we found that Microsoft Windows For Workgroups (WFW) upgrade included an FTP utility. Assuming the user of COS-Mate can get an address for the file on the mainframe, the WFW FTP tool can perform this. Additionally, WFW allows the local machine to act as a server. Instead of the user going to the mainframe to get the file, the mainframe could automatically download it to the local machine. This appears to be the best concept to date. It will be further investigated in the next phase.

Because of the tools chosen for demonstration, the Graphical User Interface to Knowledge Library interface was smooth. The only problem came when files were moved from one machine to another. For some reason the Knowledge Library continued to lose links. This deployment concern did not effect concept functions, so it will be further investigated in Phase 2.

The Graphical User Interface to Background Database Processor proved to be a challenge. All tools required data conversion. Microsoft Access provided a smooth conversion from the mainframe to the local machine. Although the files were large and the conversion takes several minutes, it was consistent and without flaw. None of the Graphical User Interface tools found would directly read Microsoft Access files. PowerBuilder converts them into their WATCOM database. LightShip has told us they are developing a new interface which reads the Access files using Open DataBase Connectivity (ODBC). For our demonstration we had to output the files from Microsoft Access into a DBF format which LightShip can read. Although this is not a major problem, it does add an extra step to the process that should be eliminated before an operational system is developed.

2.2.2 Tool Selection

Based upon the research performed, the tools selected for the first phase were:

- Microsoft Windows For Workgroups
- Microsoft Access
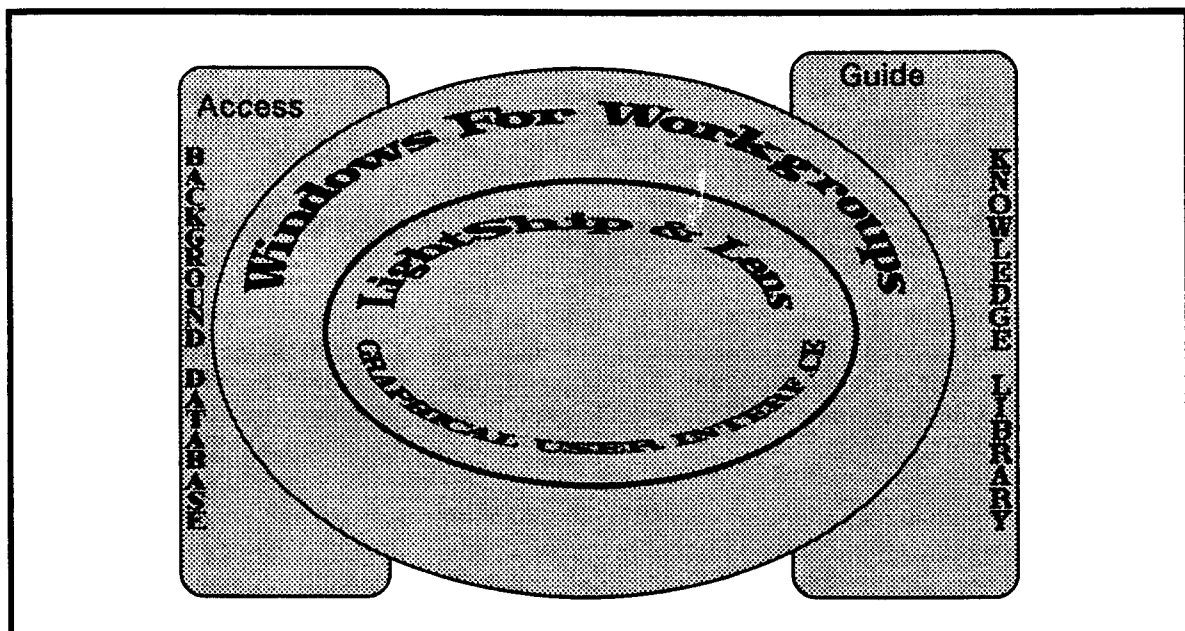- InfoAccess Guide
- Pilot LightShip and Lens

Figure 2.2-2   Tool Selection for COS-Mate Phase 1

As shown in Figure 2.2-2, the tools are integrated into one product called COS-Mate. Windows For Workgroups provides the operating system for COS-Mate. LightShip provides the screens for the user to navigate through the data. LightShip Lens provides the engine for bringing the database information to the screen graphically. Access takes the data input file, organizes it in a method that COS-Mate understands and produces an output file that LightShip and Lens can use. Guide is integrated in through LightShip. Based on where the user is in the LightShip application, the Guide links are different. Guide provides an expert help system to the user, so the Guide files are individually linked together and to various locations throughout the LightShip files. In Phase 2, we will investigate a method for automating these links through keywords of file names.

2.2.3 Architecture Considerations

We discovered two architecture considerations which may impact the ability of the Air Force to deploy this system. First and foremost is memory limitations. For this effort we worked with a single report. This file was small. However, when converted to a relational database, it grew to three times its size (as expected). Given that this data is produced daily, and users have indicated a desire to keep up to two years worth of data on-line, the required memory is significant. Additionally, based on the knowledge survey results, there are at least 6 other reports that need to be integrated into the tool. These factors point to a requirement for a server with significant resident memory. Only needed files would be down-loaded to a user's platform. This would make the function of COS-Mate seamless and smooth. Some calculations can be performed on the server as well.

For example, the prototype Stockage Effectiveness screens require a downloaded file of 80k. This file was reformatted into the relational database taking about 190K of memory. However, only five fields were used to calculate the numbers needed for the stockage effectiveness screens. These five fields would be all that COS-Mate would need locally. (This prompted the Air Force discussions to put the relational database on the mainframe.)

The second architecture concern was linkage to the mainframe. Given the server architecture above, the linkage is fundamentally the same as the numerous printers currently connected to the mainframe. A daily print file is sent to each of the printers. COS-Mate would request a daily disc file transmitted in the same manner. Without the server configuration, other options for the linkage must be considered. One option allows COS-Mate access to the mainframe data. This is critical if COS-Mate is used as an analytical tool. For example, if the user needs raw data, instead of the comprehensive data now downloaded from the mainframe, access to the mainframe is critical. Downloading raw data may take extra time, but to scale a server large enough to hold two years worth of data is not an insignificant task.

Section 3 - Decision Support System Concept Evaluation Summary

Our findings have shown a distinct need for the COS-Mate tool. A need exists to maintain a knowledge library with expert advise. This is essential with the reduction in forces required for today's military structure. The knowledge library captures the expertise of supply officers who are retiring or separating. Additionally, with the merging of various specialty codes, there will be fewer career supply officers. Many supply officers will be cross trained into the job. The knowledge library is an important tool for them.

There are two distinct combinations of software products capable of performing the Air Force supply DSS function.

COMBINATION 1	COMBINATION 2
Windows for Workgroups	Windows for Workgroups
Microsoft Access 2.0	Microsoft Access 2.0
Pilot LightShip & Lens	PowerSoft PowerBuilder
Info Access Guide	Info Access Guide

Combination 2 excels in cost of deployment. However, Combination 1 excels in ease of use. The less expensive Combination 2 requires a costly training exercise for some users. This leads us to recommend Combination 1 with a slightly higher software cost. This package is easier for a technician to learn through on the job training. The following outlines the costs of the two packages.

AIR FORCE SUPPLY LOGISTICS SUPPORT METRICS AND SOFTWARE MANIPULATION TOOL ANALYSIS

Definitions
Retail Price — Price advertised in Micro Warehouse Catalog
Best Price — Assumes upgrades and GSA Schedule use
SSC Deployment Cost — Assumes SSC purchases distribution kits for Access and Guide
Deployment Cost per User — Assume upgrades, GSA Schedule, and Distribution kits used

Option 1 COTS Package	Retail Price as of 8 Dec 94	Best Single User Price	Projected Initial SSC Deployment Cost	Projected Deployment Cost Per User	Comments
Windows for Workgroups	$139.95	$39.95	$139.95	$39.95	Best Price is Upgrade price
Microsoft Access 2.0	$299.00	$99.00	$895.00	$-	See Note 1
Pilot Lightship & Lens	$980.00	$650.00	$650.00	$650.00	Discount available on GSA schedule
Info Access Guide	$800.00	$520.00	$520.00	$30.00	See Note 2
Total	$2,218.95	$1,308.95	$2,204.95	$719.95	

Option 2 COTS Package	Retail Price as of 8 Dec 94	Best Single User Price	Projected Initial SSC Deployment Cost	Projected Deployment Cost	Comments
Windows for Workgroups	$139.95	$39.95	$139.95	$39.95	Best Price is Upgrade price
Microsoft Access 2.0	$299.00	$99.00	$895.00	$-	See Note 1
PowerSoft PowerBuilder	$2,400.00	$495.00	$2,400.00	$-	Best Price is single Desktop Version
Info Access Guide	$800.00	$520.00	$520.00	$30.00	See Note 2
Total	$3,638.95	$1,153.95	$3,954.95	$69.95	See Note 3

Note 1: Purchase of a developers kit allows maximum distribution of executables. Cost of Developers Kit is $895.00

Note 2: If no Guide development is done, then Guide offers a viewer at reduced cost.

Note 3: Although the Option 2 price is attractive, we found the training required for a skilled user to modify applications in PowerBuilder to be expensive ($3000). Option 1 uses Lightship which a user can learn with appropriate OJT. This added training cost should be carefully considered.

APPENDIX ONE
(SUPPLY KNOWLEDGE SURVEY[2])

INTRODUCTION

The objective of this survey is to capture as much information as possible from current and former chiefs of supply (COS), deputy COS and flight chiefs/superintendents concerning INFORMATION important in operating a standard base supply account. The information is consolidated and imbedded in a decision support system (DSS) module of the base level system modernization (BLSM) of supply. This information, through the DSS, provides future COS and their key staff, on-line, hyper-text help, expert advice and training in the key aspects of the supply operation.

The survey focuses on various performance indicators and asks supply managers how they dealt with negative trends in these indicators. What did they (or one of the key managers) need to know on a monthly (or other regular basis) in order to do their job.

Please answer the questions as completely as possible, keeping in mind your potential audience is a new COS, deputy or flight chief with little or no practical experience or background in operating a supply account.

Also keep in mind this DSS is designed to assist the COS with squadron commander responsibilities, as well. If you have not served as a supply squadron commander you may ignore those questions. However, if other experiences gave you insight into the commander's duties and responsibilities (like acting commander/first sergeant) feel free to provide input to this section. Section A addresses COS business (supply account operations) and section B addresses squadron commander business (good order and discipline/health morale and welfare of the troops).

Rest assured our goal is to minimize the amount of data manually entered into the DSS and maximize electronic update/interface. Your answers help us avoid including manually updated data management does not need.

I. How many total months/years experience do you have as Chief of Supply/Supply Squadron Commander?

II. How many months/years experience do you have in one or more of the key management positions in a base supply operation? Which ones? How long in each?

III. How many total months/years experience do you have in base-level supply squadron (SBSS) positions?

SECTION A: SUPPLY OPERATIONS

I. State in your own words, the **Goal** of a supply squadron (and the COS). (Example - a goal might be to "be the best supply squadron in the USAF").

II. Describe in your own words the role of the COS. What is it that the person in this position must/should contribute to the operation. (For example, is the COS primary role or contribution to ensure that the squadron has the resources it needs? (i.e., proper numbers of properly trained people)).

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[2] This survey is slightly different than one given to respondents. It has been edited for additional clarity for this report.

III. What are the most critical performance indicators supply account management should track regularly? **(Daily, or more frequently than monthly).**

    - Using the list at Attachment 1, rank the indicators in descending order of importance by placing the appropriate number in the space provided.

    - Rank only those you feel are important enough for the Supply Squadron leadership to review more frequently than monthly.

    - Do not rank the indicators by or within the categories. The categories are provided to aid in ordering the list. Rank the entire list from 1 - ?

    - Feel free to add other indicators not on the list.

    - You need not rank all of the indicators on the attachment; the list is provided as a memory jogger.

    - You may use the same rank for more than one indicator. (i.e., you may have several indicators that are equally important and deserve a number 1 ranking...)

    - A sample, filled-in form is at attachment three.

IV. For each of your top five critical indicators identified on attachment one, indicate what steps you would take (and what sources of data you would use) to investigate and correct a negative trend.

    1.

    2.

    3.

    4.

    5.

V. What are the most critical performance indicators supply account management should track in some **MONTHLY** forum like a How Goes It or a monthly maintenance meeting?

    - Using the list at attachment two, rank them in descending order of importance. placing the ranking numbers in the spaces provided.

    - Please use the guidance found in para. III to complete this list.

VI. For each of your top ten critical **monthly** indicators listed on the attachment, indicate what steps you would take and what sources of data you would use to investigate and correct a negative trend.

    1.
    2.
    3.
    4.
    5.
    6.
    7.
    8.
    9.
    10.

VII. Other than that listed above, what other types of information did you find essential to maintaining your "feel" for the health of your operation? What types of information, if any, did you find yourself frequently searching for and wishing you had at your fingertips? How often did you update yourself on this information, who did it and how?

VIII. All COS develop unique ways to deal with the complexities of the supply mission and the varied requirements of the tasks. Please provide in this section any advice, "tips", things to avoid or ideas that worked for you in managing your account/branch/section. Include things that are not taught in school or included in the "bible". (An example: one person had the warehouse personnel do daily inventories with the goal of completing all warehouses each year.)

SECTION B: SUPPLY SQUADRON COMMANDER

I.   What are the most important indicators that a squadron commander must monitor? Please rank the list below by placing the appropriate number in the space provided. (Add more if you wish). You need not rank every indicator and you can give the same rank to more than one indicator.

Military personnel management:

___VSI/SSB/early retirement - eligibles/takers
___Reenlistment rates (first term, career)
___OPR, EPR on-time rates (lates)
___Awards/decorations program status (on time rate, lates)
___Dormitory occupancy rate
___% single first termers living off-base
___Leave program management (review logs)
___Sponsor/orientation program
___Personnel security program
___Training: (PME completion rate, status/OJT status, no. Qualified trainers,
___Promotion rates
___WAPS test results
___Physical fitness program
___Weight management program

Disciplinary:

___Social Actions Survey Results
___Daily Police Blotter
___Article 15's pending (name, charge)
___Article 15 summary
___Personnel confined (to jail, to corrective custody, etc)
___39-10 discharges in progress/completed for the year, etc
___DUIs
___Bad checks, traffic tickets, DPP abuses, etc.
___Courts Martial pending (name, date, charge)
___Missed appointments

ATTACHMENT ONE TO APPENDIX ONE[3]
POTENTIAL <u>DAILY</u>
(OR MORE FREQUENT THAN MONTHLY)
PERFORMANCE INDICATORS

<u>RANK</u>

Wartime Operations

____ Status of deployed RSPs (status of reparables)
____ Status of deployed personnel
____ Status of deployed equipment
____ Wartime checklist
____ Wing/Supply Squadron tasking(s) (number personnel tasked, UTCs supported, etc)

Readiness (unclassified) - Wing/Base

____ RSP status
____ Status of mobility bags and weapons (fill rates)
____ Status of Wing weapon systems (i.e., MC, FMC, TNMCS, TNMCB, etc)
____ Status of mobility support equipment (MSE)
____ SORTS summary

Readiness (unclassified) - Squadron

____ Combat training status (chem warfare, mobility, buddy care, small arms)
____ Mobility/Deployment training status (transportation augmentees, etc)
____ Personnel status (can we meet our DOC tasking?) - assigned vs tasked by UTC/grade/
skill level...who's not ready?/why?...leave/tdy, etc.

Weapon system support (Aircraft, communications, missiles, etc)

____ TNMCS, MICAP requisitions/status, cann rates (maintenance and supply), lateral
support.

        -MICAP analysis - delete codes, cause codes,
____   -MRSP warstoppers - total account asset position
        -Delayed discrepancies
____ Critical equipment - runway sweepers, barriers, fire trucks, etc
____ Repair cycle statistics (% RTS, NRTS, COND, etc), AWP status, OAMs,
____ Bench stock fill rate (by organization), bench stock MICAP rate

Stock Control

____ Releveling, follow-up, file status,
____ MACR settings,
____ Delinquent DIFM/RSD "inflators" (i.e., DIFM >6 days old), RSD items
approaching/over 60 days old,
____ Priority requisition rate,
____ Issue/stockage effectiveness by weapon system,

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[3] This survey is slightly different than one given to respondents. It has been edited for additional clarity for this report.

___ Local purchase status,
___ Excesses,
___ TAR (no. Details),
___ Follow-up (no. Of 98, 97, etc details),

___ Receipt-not-due-in rate,
___ Non-stocked items backorder ratio,

Account Management

___ Transaction analysis/trends (total trans, receipts, issues, DORs, MSIs, IADs, etc),
___ Suspenses (higher HQ, wing, etc)
___ Surveillances (follow-up, overdue, schedule)

Inventory Management

___ Frozen records (rate), time to clear frozen records,
___ Special inventories accomplished/scheduled, scheduled inventories, past due inventory,
___ Warehouse refusals, warehouse refusal rate,
___ Inventory accuracy,
___ Reverse post transactions, reverse post rate,
___ Identity changes,
___ Analysis of adjustments (duplicates/recurring/pilferable/sensitive, etc),
___ Serviceable balance no location,
___ Data bank accuracy,
___ Turnover rate, turnover time,
___ Inventory effectiveness ratio,
___ Unreported excess inventory rate,

Stock Fund:
___ sales,
___ credit returns,
___ DLR NRTS,
___ losses,
___ in-transit,
___ MACR settings,
___ DLR cost per flying hour,
___ stock fund ratio

Squadron O&M:
___ budget, spent, spend rate

Civilian Personnel Management

___ auth/asgd, gains/losses, TDY, leave, etc.
___ training
___ classifications in progress
___ annual performance plans
___ annual performance reports

Computer Operations

___ **Regional Mainframe status** - (up/down) - PM schedule, unscheduled maintenance, scheduled software changes/uploads
___ **Squadron Terminal status** - #in, #out, etc

___ **Squadron PC status** - #auth, # on hand, # funded and on order, etc.
___ Other systems (MASS, etc)
___ Review of past 24 hours operational status
___ Data transmission status (ADRSS, etc)

Customer Support

___ Issue/stockage effectiveness by weapon system,
___ Delinquent documents,
___ Warehouse refusals,
___ TNMCS rates,
___ Delivery times,
___ Customer wait time,
___ Retail sales backorders,
___ Customer training,
___ Rejects, clear card review,
___ Parts store pick-up times

Squadron Equipment Status

___ vehicles, forklifts, refuelers, MMHS,

Resources

___ Facilities status (out of operation, danger tagged, repairs, future MCP, etc)

Fuels Operations

___ status of hydrants, refuelers, hot pits,
___ average response time, late refuelings,
___ bulk storage (balance, last receipt, next scheduled receipt)
___ quality (any tanks, refuelers out of service for quality, ETIC)
___ total issues (jet fuel, mogas, heating oil)
___ percent of fuels personnel "hot-pit" qualified

Planning

___ future Wing/Squadron TDYs/deployments
___ future Wing/Squadron OREs, exercises
___ important events/dates (like VIPs, open houses, etc)
___ Critical recurring suspenses (annual supply/fuels personnel awards, annual Deadalian competition, annual API competition, etc)
___ Special projects

ATTACHMENT TWO TO APPENDIX ONE[4]
POTENTIAL <u>MONTHLY</u> PERFORMANCE INDICATORS

<u>RANK</u>

Wartime Operations

___ Status of deployed RSPs (status of reparables)
___ Status of deployed personnel
___ Status of deployed equipment
___ Wartime checklist
___ Wing/Supply Squadron tasking(s) (number personnel tasked, UTCs supported, etc)

Readiness (unclassified) - Wing/Base

___ RSP status
___ Status of mobility bags and weapons (fill rates)
___ Status of Wing weapon systems (i.e., MC, FMC, TNMCS, TNMCB, etc)
___ Status of mobility support equipment (MSE)
___ SORTS summary

Readiness (unclassified) - Squadron

___ Combat training status (chem warfare, mobility, buddy care, small arms)
___ Mobility/Deployment training status (transportation augmentees, etc)
___ Personnel status (can we meet our DOC tasking?) - assigned vs tasked by UTC/grade/ skill level...who's not ready?/why?...leave/tdy, etc.

Weapon system support (Aircraft, communications, missiles, etc)

___ TNMCS, MICAP requisitions/status, cann rates (maintenance and supply), lateral
support.
___ -MICAP analysis - delete codes, cause codes,
___ -MRSP warstoppers - total account asset position
___ -Delayed discrepancies
___ Critical equipment - runway sweepers, barriers, fire trucks, etc
___ Repair cycle statistics (% RTS, NRTS, COND, etc), AWP status, OAMs,
___ Bench stock fill rate (by organization), bench stock MICAP rate

Stock Control

___ Releveling, follow-up, file status,
___ MACR settings,
___ Delinquent DIFM/RSD "inflators" (i.e., DIFM >6 days old), RSD items approaching/over 60 days old,
___ Priority requisition rate,
___ Issue/stockage effectiveness by weapon system,
___ Local purchase status,
___ Excesses,
___ TAR (no. Details),

---

[4] This survey is slightly different than one given to respondents. It has been edited for additional clarity for this report.

____   Follow-up (no. Of 98, 97, etc details),

____   Receipt-not-due-in rate,
____   Non-stocked items backorder ratio,

Account Management

____   Transaction analysis/trends (total trans, receipts, issues, DORs, MSIs, IADs, etc),
____   Suspenses (higher HQ, wing, etc)
____   Surveillances (follow-up, overdue, schedule)

Inventory Management

____   Frozen records (rate), time to clear frozen records,
____   Special inventories accomplished/scheduled, scheduled inventories, past due inventory,
____   Warehouse refusals, warehouse refusal rate,
____   Inventory accuracy,
____   Reverse post transactions, reverse post rate,
____   Identity changes,
____   Analysis of adjustments (duplicates/recurring/pilferable/sensitive, etc),
____   Serviceable balance no location,
____   Data bank accuracy,
____   Turnover rate, turnover time,
____   Inventory effectiveness ratio,
____   Unreported excess inventory rate,

Stock Fund:
____   sales,
____   credit returns,
____   DLR NRTS,
____   losses,
____   in-transit,
____   MACR settings,
____   DLR cost per flying hour,
____   stock fund ratio

Squadron O&M:
____   budget, spent, spend rate

Civilian Personnel Management

____   auth/asgd, gains/losses, TDY, leave, etc.
____   training
____   classifications in progress
____   annual performance plans
____   annual performance reports

Computer Operations

____   **Regional Mainframe status** - (up/down) - PM schedule, unscheduled maintenance, scheduled software changes/uploads
____   **Squadron Terminal status** - #in, #out, etc

___ **Squadron PC status** - #auth, # on hand, # funded and on order, etc.
___ Other systems (MASS, etc)
___ Review of past 24 hours operational status
___ Data transmission status (ADRSS, etc)

Customer Support

___ Issue/stockage effectiveness by weapon system,
___ Delinquent documents,
___ Warehouse refusals,
___ TNMCS rates,
___ Delivery times,
___ Customer wait time,
___ Retail sales backorders,
___ Customer training,
___ Rejects, clear card review,
___ Parts store pick-up times

Squadron Equipment Status

___ vehicles, forklifts, refuelers, MMHS,

Resources

___ Facilities status (out of operation, danger tagged, repairs, future MCP, etc)

Fuels Operations

___ status of hydrants, refuelers, hot pits,
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___ bulk storage (balance, last receipt, next scheduled receipt)
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___ percent of fuels personnel "hot-pit" qualified

Planning

___ future Wing/Squadron TDYs/deployments
___ future Wing/Squadron OREs, exercises
___ important events/dates (like VIPs, open houses, etc)
___ Critical recurring suspenses (annual supply/fuels personnel awards, annual Deadalian competition, annual API competition, etc)
___ Special projects

APPENDIX TWO
(SUPPLY KNOWLEDGE SURVEY[5])

INTRODUCTION

The objective of this survey is to capture as much information as possible from current and former chiefs of supply (COS), deputy COS and flight chiefs/superintendents concerning INFORMATION important in operating a standard base supply account. The information is consolidated and imbedded in a decision support system (DSS) module of the base level system modernization (BLSM) of supply. This information, through the DSS, provides future COS and their key staff, on-line, hyper-text help, expert advice and training in the key aspects of the supply operation.

The survey focuses on various performance indicators and asks supply managers how they dealt with negative trends in these indicators. What did they (or one of the key managers) need to know on a monthly (or other regular basis) in order to do their job.

Please answer the questions as completely as possible, keeping in mind your potential audience is a new COS, deputy or flight chief with little or no practical experience or background in operating a supply account.

Also keep in mind this DSS is designed to assist the COS with squadron commander responsibilities, as well. If you have not served as a supply squadron commander you may ignore those questions. However, if other experiences gave you insight into the commander's duties and responsibilities (like acting commander/first sergeant) feel free to provide input to this section. Section A addresses COS business (supply account operations) and section B addresses squadron commander business (good order and discipline/health morale and welfare of the troops).

Rest assured our goal is to minimize the amount of data manually entered into the DSS and maximize electronic update/interface. Your answers help us avoid including manually updated data management does not need.

I.   How many total months/years experience do you have as Chief of Supply/Supply Squadron Commander?

II.   How many months/years experience do you have in one or more of the key management positions in a base supply operation? Which ones? How long in each?

III. How many total months/years experience do you have in base-level supply squadron (SBSS) positions?

SECTION A: SUPPLY OPERATIONS

I.   State in your own words, the **Goal** of a supply squadron (and the COS). (Example - a goal might be to "be the best supply squadron in the USAF").

II.   Describe in your own words the role of the COS. What is it that the person in this position must/should contribute to the operation. (For example, is the COS primary role or contribution to ensure that the squadron has the resources it needs? (i.e., proper numbers of properly trained people)).

---

[5] This survey is slightly different than one given to respondents. It has been edited for additional clarity for this report.

III. What are the most critical performance indicators supply account management should track regularly? **(Daily, or at least more frequently than monthly).**

     - Using attachment one, rank the indicators in descending order of importance by placing the appropriate number in the space provided.

     - Rank only those you feel are important enough for the Supply Squadron leadership to review more frequently than monthly.

     - Do not rank the indicators by or within the categories. The categories are provided only to aid in ordering the list. Rank the entire list from 1 - ?

     - You may use the same ranking for more than one indicator. (i.e., you may have several indicators that are equally important and deserve a number 1 ranking).

     - You need not rank all of the indicators on the list. The list is provided as a memory jogger.

     - Feel free to add others not on the list.

     - A sample, filled in form is at attachment three.

IV. What are the most critical performance indicators supply account management should track in some **monthly** forum like a How Goes It or a monthly maintenance meeting?

     - Using the list at attachment two, rank them as outlined in para. III above, placing the ranking number in the spaces provided.

V. Other than that listed above, what other types of information did you find essential to maintaining your "feel" for the health of your operation? What types of information, if any, did you find yourself frequently searching for and wishing you had at your fingertips? How often did you update yourself on this information, who did it and how?

VI. Every supply leader developed unique ways to deal with the complexities of the supply mission and the varied requirements of the tasks. Please provide in this section any advice, "tips', things to avoid or ideas that worked for you in managing your account/branch/section. Include things that aren't taught in school or included in the "bible". (An example: one person had his warehouse personnel do daily inventories with the goal of completing all warehouses each year.) If you need more space, please continue on the back of this page.

SECTION B: SUPPLY SQUADRON COMMANDER

I. What are the most important indicators that a squadron commander must monitor? Please rank the list below by placing the appropriate number in the space provided. (Add more if you wish). You need not rank every indicator and you can give the same rank to more than one indicator.

     Military personnel management:

          ___VSI/SSB/early retirement - eligibles/takers
          ___Reenlistment rates (first term, career)
          ___OPR, EPR on-time rates (lates)
          ___Awards/decorations program status (on time rate, lates)
          ___Dormitory occupancy rate
          ___% single first termers living off-base
          ___Leave program management (review logs)
          ___Sponsor/orientation program
          ___Personnel security program
          ___Training: (PME completion rate, status/OJT status, no. Qualified trainers,
          ___Promotion rates
          ___WAPS test results
          ___Physical fitness program
          ___Weight management program

AIR FORCE SUPPLY LOGISTICS SUPPORT METRICS AND SOFTWARE MANIPULATION TOOL ANALYSIS

Disciplinary:

    ___Social Actions Survey Results
    ___Daily Police Blotter
    ___Article 15's pending (name, charge)
    ___Article 15 summary
    ___Personnel confined (to jail, to corrective custody, etc)
    ___39-10 discharges in progress/completed for the year, etc
    ___DUIs
    ___Bad checks, traffic tickets, DPP abuses, etc.
    ___Courts Martial pending (name, date, charge)
    ___Missed appointments

ATTACHMENT ONE TO APPENDIX 2[6]
POTENTIAL <u>DAILY</u>
(OR MORE FREQUENTLY THAN MONTHLY)
PERFORMANCE INDICATORS

<u>RANK</u>

Wartime Operations

___ Status of deployed RSPs (status of reparables)
___ Status of deployed personnel
___ Status of deployed equipment
___ Wartime checklist
___ Wing/Supply Squadron tasking(s) (number personnel tasked, UTCs supported, etc)

Readiness (unclassified) - Wing/Base

___ RSP status
___ Status of mobility bags and weapons (fill rates)
___ Status of Wing weapon systems (i.e., MC, FMC, TNMCS, TNMCB, etc)
___ Status of mobility support equipment (MSE)
___ SORTS summary

Readiness (unclassified) - Squadron

___ Combat training status (chem warfare, mobility, buddy care, small arms)
___ Mobility/Deployment training status (transportation augmentees, etc)
___ Personnel status (can we meet our DOC tasking?) - assigned vs tasked by UTC/grade/ skill level...who's not ready?/why?...leave/tdy, etc.

Weapon system support (Aircraft, communications, missiles, etc)

___ TNMCS, MICAP requisitions/status, cann rates (maintenance and supply), lateral support.

        ___ -MICAP analysis - delete codes, cause codes,
        ___ -MRSP warstoppers - total account asset position
        ___ -Delayed discrepancies
___ Critical equipment - runway sweepers, barriers, fire trucks, etc
___ Repair cycle statistics (% RTS, NRTS, COND, etc), AWP status, OAMs,
___ Bench stock fill rate (by organization), bench stock MICAP rate

Stock Control

___ Releveling, follow-up, file status,
___ MACR settings,
___ Delinquent DIFM/RSD "inflators" (i.e., DIFM >6 days old), RSD items approaching/over 60 days old,
___ Priority requisition rate,
___ Issue/stockage effectiveness by weapon system,
___ Local purchase status,

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[6] This survey is slightly different than one given to respondents. It has been edited for additional clarity for this report.

___ Excesses,
___ TAR (no. Details),
___ Follow-up (no. Of 98, 97, etc details),

___ Receipt-not-due-in rate,
___ Non-stocked items backorder ratio,

Account Management

___ Transaction analysis/trends (total trans, receipts, issues, DORs, MSIs, IADs, etc),
___ Suspenses (higher HQ, wing, etc)
___ Surveillances (follow-up, overdue, schedule)

Inventory Management

___ Frozen records (rate), time to clear frozen records,
___ Special inventories accomplished/scheduled, scheduled inventories, past due inventory,
___ Warehouse refusals, warehouse refusal rate,
___ Inventory accuracy,
___ Reverse post transactions, reverse post rate,
___ Identity changes,
___ Analysis of adjustments (duplicates/recurring/pilferable/sensitive, etc),
___ Serviceable balance no location,
___ Data bank accuracy,
___ Turnover rate, turnover time,
___ Inventory effectiveness ratio,
___ Unreported excess inventory rate,

Stock Fund:
___ sales,
___ credit returns,
___ DLR NRTS,
___ losses,
___ in-transit,
___ MACR settings,
___ DLR cost per flying hour,
___ stock fund ratio

Squadron O&M:
___ budget, spent, spend rate

Civilian Personnel Management

___ auth/asgd, gains/losses, TDY, leave, etc.
___ training
___ classifications in progress
___ annual performance plans
___ annual performance reports

Computer Operations

__   **Regional Mainframe status -** (up/down) - PM schedule, unscheduled maintenance, scheduled software changes/uploads

__   **Squadron Terminal status -** #in, #out, etc

__   **Squadron PC status -** #auth, # on hand, # funded and on order, etc.

__   Other systems (MASS, etc)

__   Review of past 24 hours operational status

__   Data transmission status (ADRSS, etc)

Customer Support

__   Issue/stockage effectiveness by weapon system,

__   Delinquent documents,

__   Warehouse refusals,

__   TNMCS rates,

__   Delivery times,

__   Customer wait time,

__   Retail sales backorders,

__   Customer training,

__   Rejects, clear card review,

__   Parts store pick-up times

Squadron Equipment Status

__   Vehicles, forklifts, refuelers, MMHS,

Resources

__   Facilities status (out of operation, danger tagged, repairs, future MCP, etc)

Fuels Operations

__   status of hydrants, refuelers, hot pits,

__   average response time, late refuelings,

__   bulk storage (balance, last receipt, next scheduled receipt)

__   quality (any tanks, refuelers out of service for quality, ETIC)

__   total issues (jet fuel, mogas, heating oil)

__   percent of fuels personnel "hot-pit" qualified

Planning

__   future Wing/Squadron TDYs/deployments

__   future Wing/Squadron OREs, exercises

__   important events/dates (like VIPs, open houses, etc)

__   Critical recurring suspenses (annual supply/fuels personnel awards, annual Deadalian competition, annual API competition, etc)

__   Special projects

ATTACHMENT TWO TO APPENDIX TWO[7]
POTENTIAL <u>MONTHLY</u> PERFORMANCE INDICATORS

<u>RANK</u>

Wartime Operations

___ Status of deployed RSPs (status of reparables)
___ Status of deployed personnel
___ Status of deployed equipment
___ Wartime checklist
___ Wing/Supply Squadron tasking(s) (number personnel tasked, UTCs supported, etc)

Readiness (unclassified) - Wing/Base

___ RSP status
___ Status of mobility bags and weapons (fill rates)
___ Status of Wing weapon systems (i.e., MC, FMC, TNMCS, TNMCB, etc)
___ Status of mobility support equipment (MSE)
___ SORTS summary

Readiness (unclassified) - Squadron

___ Combat training status (chem warfare, mobility, buddy care, small arms)
___ Mobility/Deployment training status (transportation augmentees, etc)
___ Personnel status (can we meet our DOC tasking?) - assigned vs tasked by UTC/grade/
    skill level...who's not ready?/why?...leave/tdy, etc.

Weapon system support (Aircraft, communications, missiles, etc)

___ TNMCS, MICAP requisitions/status, cann rates (maintenance and supply), lateral
support.
        -MICAP analysis - delete codes, cause codes,
___   -MRSP warstoppers - total account asset position
___   -Delayed discrepancies
___ Critical equipment - runway sweepers, barriers, fire trucks, etc
___ Repair cycle statistics (% RTS, NRTS, COND, etc), AWP status, OAMs,
___ Bench stock fill rate (by organization), bench stock MICAP rate

Stock Control

___ Releveling, follow-up, file status,
___ MACR settings,
___ Delinquent DIFM/RSD "inflators" (i.e., DIFM >6 days old), RSD items
    approaching/over 60 days old,
___ Priority requisition rate,
___ Issue/stockage effectiveness by weapon system,
___ Local purchase status,
___ Excesses,
___ TAR (no. Details),

---

[7] This survey is slightly different than one given to respondents. It has been edited for additional clarity for this report.

___   Follow-up (no. Of 98, 97, etc details),

___   Receipt-not-due-in rate,

___   Non-stocked items backorder ratio,

Account Management

___   Transaction analysis/trends (total trans, receipts, issues, DORs, MSIs, IADs, etc),

___   Suspenses (higher HQ, wing, etc)

___   Surveillances (follow-up, overdue, schedule)

Inventory Management

___   Frozen records (rate), time to clear frozen records,

___   Special inventories accomplished/scheduled, scheduled inventories, past due inventory,

___   Warehouse refusals, warehouse refusal rate,

___   Inventory accuracy,

___   Reverse post transactions, reverse post rate,

___   Identity changes,

___   Analysis of adjustments (duplicates/recurring/pilferable/sensitive, etc),

___   Serviceable balance no location,

___   Data bank accuracy,

___   Turnover rate, turnover time,

___   Inventory effectiveness ratio,

___   Unreported excess inventory rate,

Stock Fund:
___   sales,

___   credit returns,

___   DLR NRTS,

___   losses,

___   in-transit,

___   MACR settings,

___   DLR cost per flying hour,

___   stock fund ratio

Squadron O&M:
___   budget, spent, spend rate

Civilian Personnel Management

___   auth/asgd, gains/losses, TDY, leave, etc.

___   training

___   classifications in progress

___   annual performance plans

___   annual performance reports

Computer Operations

___   **Regional Mainframe status -** (up/down) - PM schedule, unscheduled maintenance, scheduled software changes/uploads

___   **Squadron Terminal status -** #in, #out, etc

___ **Squadron PC status** - #auth, # on hand, # funded and on order, etc.
___ Other systems (MASS, etc)
___ Review of past 24 hours operational status
___ Data transmission status (ADRSS, etc)

Customer Support

___ Issue/stockage effectiveness by weapon system,
___ Delinquent documents,
___ Warehouse refusals,
___ TNMCS rates,
___ Delivery times,
___ Customer wait time,
___ Retail sales backorders,
___ Customer training,
___ Rejects, clear card review,
___ Parts store pick-up times

Squadron Equipment Status

___ vehicles, forklifts, refuelers, MMHS,

Resources

___ Facilities status (out of operation, danger tagged, repairs, future MCP, etc)

Fuels Operations

___ status of hydrants, refuelers, hot pits,
___ average response time, late refuelings,
___ bulk storage (balance, last receipt, next scheduled receipt)
___ quality (any tanks, refuelers out of service for quality, ETIC)
___ total issues (jet fuel, mogas, heating oil)
___ percent of fuels personnel "hot-pit" qualified

Planning

___ future Wing/Squadron TDYs/deployments
___ future Wing/Squadron OREs, exercises
___ important events/dates (like VIPs, open houses, etc)
___ critical recurring suspenses (annual supply/fuels personnel awards, annual Deadalian competition, annual API competition, etc)
___ Special projects

APPENDIX THREE
(INTERVIEW SUMMARY)

	HQ USAF	HQ ACC	SSC	1 SUP	RETIRED	TOTAL
COLONEL	1	2				3
LT COL	2	1	1	1		5
MAJOR	2	1	1			4
CAPTAIN			1			1
CIVILIAN				1		1
C/SMSGT	1	1	1		1	4
TOTAL	6	5	4	2	1	18

APPENDIX FOUR
(SURVEY SUMMARY)

	HQ USAF	ACC	AMC	PACAF	AFMC	SSC	COS	RETIRED	TOTAL
COLONEL				1	1	1			3
LT COL	1					1	1		3
MAJOR	1					1			2
CAPT						1			1
CIVILIAN			1						1
CMSGT		1						1	2
TOTAL	2	1	1	1	1	4	1	1	12

APPENDIX FIVE
(INTERVIEW AND QUESTIONNAIRE RESPONSES)

QUESTION #1
State, in your own words, the Goal of a supply squadron (and the COS).

RESPONDENT # 6 - "To maintain the right mix of assets for timely provision to the customer while maintaining accountability and account integrity."

RESPONDENT #13 - " Provide the right part at the right time - provide best mission capable support possible - minimize customer backorders - work as a team (between flights)."

RESPONDENT #14 - "To stock, store, and issue weapon system, CE, transportation and general base supplies and equipment assets to ensure the wing can meet its wartime commitments. To do this at least cost to wing resources."

RESPONDENT #15 - "100% on hand parts for aircraft - 0 delays in take-offs due to supply/fuels support. Secondary goal - support the base with normal everyday supplies - 100% customer satisfaction."

RESPONDENT #16 - "Have the best motivated squadron in the Air Force."

RESPONDENT #17 - "To provide the optimum support to ensure our part in meeting the wing mission by being the most effective supply squadron in the USAF."

RESPONDENT #19 - "Provide quality customer service. Improve quality of assigned personnel through training. Insure the fuels personnel are fully integrated into the squadron."

RESPONDENT #20 - "To get parts to crew chiefs 8 out of 10 times requested - in 15 minutes."

RESPONDENT #21 - "Support the wing mission to the best of my ability with needed supply/equipment/fuel. Provide the support to all of my customers that will permit them to perform their mission."

RESPONDENT #22 - "Provide distribution support to base customers"

RESPONDENT #23 - "To provide quality service to all our customers."

QUESTION #2
How would you describe the most important objective of the COS? What are some of the COS' other objectives?

RESPONDENT #6 - "In my mind, the most important objective is to keep the mission of your wing going, whether that be a flying mission, missile mission or administrative mission."

RESPONDENT #13 - "Educate your supply squadron to meet customer demands/expectations. Understand your DOC and how it relates to the mission of the wing. Understand key METRICS that measure supply efficiency and be able to explain to the wing/CC and LG/CC."

RESPONDENT #14 - "To take care of my people - they will take care of the mission."

RESPONDENT #16 - "Make the supply squadron a totally INTEGRATED part of the wing mission."

RESPONDENT #17 - "Lowest MICAP rates in the USAF. Win AF Supply Deadalian."

QUESTION #3
Describe in your own words the role of the COS. What is it that the person in this position must/should contribute to the operation?

RESPONDENT #6 - "The COS should serve as a facilitator for his/her squadron. That means having the right mix of players, maintaining discipline, opening the idea (*way*) for new ideas, providing the fertilizer, if you will, that allows a squadron to grow and develop into a cohesive team."

RESPONDENT #13 - "COS is the supply ambassador for the base. Know and understand what is happening, at depots. MAJCOMS, or Air Staff. Make key personnel assignments and motivate accordingly. Must be visible - a good listener - a problem solver.

RESPONDENT #14 - "To facilitate the overall operation - to serve as a coach for the flight chiefs to manage their operations. My role (is) to contribute past experience and to facilitate in the problem solving process.

RESPONDENT #16 - "Provide leadership and guidance to the squadron."

RESPONDENT #17 - "The role of the COS is to provide the vision for the squadron and the guidance and resources to get there."

RESPONDENT #19 - "Provide the overall guidance for running the supply squadron:
-Insure (your key people) have general knowledge of the Supply operation and how it interacts with other organizations in the wing (maintenance, contracting)
-Be the point person for innovative ideas and act as a buffer with the LG, etc.
-Be aware of the wholesale system and how it affects the squadron's ability to support the wing.
-Insure the squadron has the tools necessary to operate (computers, dollars, equipment)

RESPONDENT #20 - "He is the "leader" who provides resources, teaches, and goes to war with his people. He should know his officers, NCOs and airmen. He should understand the processes and subprocesses that make the "supply machine" function. He should be familiar and know when the system breaks down (choke points), receiving, shop service center, inventory, MICAP, FCC, etc. He must be willing to intervene and fix processes - He must have knowledge and guts."

RESPONDENT #21 - "The COS must maintain the integrity of the supply account for which he is accountable. That means he must balance all the requirements competing for limited stock fund dollars and make the decisions that will allow optimum support to the customers. Internally, he must ensure he maintains a well-trained force capable of carrying out their specific duties as they as a team manage the account and support the customers."

RESPONDENT #22 - "Manage the resources assigned with integrity. Resources include facilities, equipment, money, stocked parts, and people. "Manage" implies all activities required to protect the taxpayers investments and uphold Title X requirements of accountability."

RESPONDENT #23 - "LEADERSHIP - decision-making."

QUESTION #4
Describe a typical day for the COS or his/her key management personnel.

RESPONDENT #6 - "I would expect a typical day to include a visit to as many elements as possible (management by wandering around), review of MICAP and fuels stats, review of problems from the previous day (i.e., what progress has been made towards resolution), review of delinquent documents and rejects, visits to my customers."

RESPONDENT #13 - "Must review receiving line every day - visit MICAP section - and RPS. Review flying schedule - coordinate with COSO and Fuels. Review D14 daily to review trends. Have daily stand up with flight chiefs. Coordinate with fellow squadron CCs to ensure healthy working relations. Check with stock fund manager,"

RESPONDENT # 14 - "MICAP status briefing. Wing stand up. Meeting with LG and contracting and customers. Walk about squadron - receiving/FCC."

RESPONDENT #16 - "Get out into the flights and learn the people. Visit customers to discuss the good and bad supply is doing. Ensure supervisors know what their job is and that all subordinates are getting the training required to accomplish their job."

RESPONDENT #17 - "It is imperative that these folks spend the majority of their day in the elements, being visible and having a feel for the pulse of the squadron."

QUESTION #5
This question was dropped from the questionnaire.

QUESTION #6
What are the most critical performance indicators supply account management should track daily (or more frequently than monthly)?

RESPONDENT #1 - "Movement of DIFM. RSD items approaching penalty (>60 days). Computer status. Status of reps from deployed RSPs. Cann actions. DLR "float". Total asset position of all warstoppers."

RESPONDENT #2 - "SIFS/ADRSS, ETC."

RESPONDENT #3 - "Blotter. Facility and Vehicle status. Critical resources status (hydrants, hot pits, barriers, etc). Wing weapon systems. Personnel mobility readiness.

RESPONDENT #4 - "Issue/stockage effectiveness for the weapon system and overall. Repair cycle performance (buckets...cum repair time and daily repair time.) NMCS time (from CAMS). Shipment suspense details. Turn-ins (avg #/day compared to total trans) Reverse posts. DLRs - float belonging to supply. Cancellations. Lost discounts/interest penalties. SIFS report. Local purchase (# requisitions with Z4 status - no description.)

RESPONDENT #5 - "NMCS. DLR status (money.) Repair cycle. Inventory accuracy/adjustments. Readiness.

RESPONDENT #6 - "SIFS report. RSD status (use ACC 203). Readiness. Suspenses, delinquent rejects/documents, deployed RSP/personnel, refueling equipment status, weapon system status (NMC,

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TNMCS rates, etc). Regional mainframe status, warehouse refusals, bulk storage receipts, future events, delayed discrepancies, MRSP showstoppers, MICAP analysis."

RESPONDENT #7 - "RSD float (what are your hi value NSNs?). Money - GSD, SSD, RSD, O&M. Inventory accuracy/adjustments. Parts store issue effectiveness. Reject ratio (to total trans). MICAP data from D165 - # starts by NSN, high NSN incidents.

RESPONDENT #9 - "Can I go to war? "

RESPONDENT #10 - " Are requisitions getting out (SIFS)? MRSP inventory accuracy.

RESPONDENT #11 - "Fuels - flightline ops status. MS&D - receiving volume, delivery problems."

RESPONDENT #12 - "Stock fund ratio. Local purchase and non LP obs. Gross sales.

RESPONDENT #13 - "SIFS scorecard, On hand balances of critical (pacing) items, bench stock issue effectiveness, MICAP cause codes, MICAP incidents, AWP incidents/cause codes."

RESPONDENT #14 - "MICAPS, RSP status, delinquent rejects, delinquent documents, delinquent DIFM."

RESPONDENT #15 - "Fuels level vs WRM level, MICAP rates/cause codes, projected fuel consumption, projected orders/receipts, waivers in place."

RESPONDENT #16 - "Delinquent documents, rejects, warehouse refusals, regional mainframe status, squadron terminal status, MRSP warstoppers, MICAP rates, repair cycle status, squadron equipment status, DLR NRTS, customer wait time."

RESPONDENT #17 - "MICAP status, RSP warstoppers, suspenses, delinquent documents, rejects, TNMCS rates, RSP status, stock fund ratio, computer ops status, squadron O&M status."

RESPONDENT #18 - "MICAPS - number of parts, number of jets, number of parts/tail no., number with/without status. Delinquent docs, reject clear cards. Reverse posts, O&M $$, suspenses, SORTS, fighter squadron MRSP fill rates, MSE fill rates, mobility bag status, CWDE status."

RESPONDENT #19- "Status of Wing/Squadron tasking, status of deployed personnel, RSPs, equipment. Readiness of RSP, equipment, people. MICAP summary, warstopper status, repair cycle health, warehouse refusals, special inventories, frozen records. Stock fund sales, DLR NRTS. Computer support status. Delinquent docs, delivery times, TNMCS rate. Equipment and facilities status. Fuels - Hydrants, hot pits, inventory and quality problems.

RESPONDENT #20 - "Status of deployed personnel/RSP, wing weapons systems status (NMCS, etc), MICAP status, releveling, follow-up, file status. Frozen records. Regional mainframe status, status of MASS, SIFS. Delinquent documents, warehouse refusals, issue effectiveness by weapon system, parts store pick up times. Status of hydrants, refuelers, hot pits. Average response times, late refuelings.

RESPONDENT #21 - "Status of wing weapon systems. MICAP status, MRSP warstoppers, critical equipment. Releveling, f/u, file status. Suspenses. Regional mainframe status, squadron terminal status, past 24 hrs ops, SIFS. Delinquent documents. Squadron equipment status. Status of Hydrants, etc., average response times, lates., quality incidents, total issues."

RESPONDENT #22 - "Status of wing weapon systems. MICAP status, delayed discrepancies, cause/delete codes. Issue/stockage effectiveness by weapon system. Excesses. Followup. Receipts not due-in. Analysis of adjustments. Reverse posts. Stock fund ratio, sales, obligations. Squadron terminal

status, % on-line for use, MASS status, SIFS. TNMCS rates. Delinquent docs, issue/stockage effectiveness by weapon system, parts store pick up times. Average fuel delivery response times, lates. Status of hydrants, refuelers, hot pits. "

RESPONDENT #23 - "TNMCS, stockage effectiveness. Suspenses, Regional mainframe status, squadron terminal status, past 24 hrs computer support.."

QUESTION #7
What performance indicators should the COS and his key managers review monthly?

RESPONDENT #6 - "releveling, follow -up, inventory management, manning, squadron vehicle status, average fuel delivery response time, stock fund, combat readiness, SORTS, customer support. "

RESPONDENT #13 - "MICAP, cann rate, SORTS, AWP >60 days, overage bench stock backorders, inventory losses, excess. DIFM (float), delinquent docs, stock fund status."

RESPONDENT #14 - " issue effectiveness, stock effectiveness, mobility training, RSP status, inventory accuracy, reverse post rate, funds mgt., personnel manning, computer time, surveillance results."

RESPONDENT #15 - "late take offs due to fuels/supply, refueler status, manning."

RESPONDENT #16 - "Fuels average response time, releveling, follow-up, AWP, status of deployed equipment/personnel, stock fund ratio, analysis of inventory adjustments, customer training, retail sales backorders."

RESPONDENT #17 - "Fuels workload (FCC), fuels equipment status, quality problems - status, inventory status, SIOATH quantity.

RESPONDENT #18 - "MRSP fill rates, SE fill rates, Mobility Bag fill rates, TNMCS rate, Inventory accuracy, Total # of transactions, O&M, stock fund ratio, vehicle status, Fuels issues, response times. Manning, training, TDY personnel. Repair cycle stats - NRTS, COND, RTS, repair cycle times, etc. AWP.

RESPONDENT #19 - "see questionnaire..."

RESPONDENT #20 - "Mobility bag fill, MSE fill rates, combat raining status, mobility/deployment status, bench stock fill rate"

RESPONDENT #21 - "wartime tasking, mob bag status, MSE status, SORTS, combat training, mobility/deployment status, personnel status, MICAP summary, repair cycle stats, bench stock fill, MACR, priority requisition rate, issue/stockage effect by weapon system, local purchase summary, excess status, TAR, receipt not due in rate, nonstocked items backorder ratio, transaction analysis, surveillances. ALL inventory management indicators. ALL Funds Management indicators. ALL funds, personnel management indicators

RESPONDENT #22 - "TNMCS, MICAP analysis, delayed discrepancies, issue/stockage effect by weapon system, average fuel response time."

RESPONDENT #23 - "see questionnaire..."

QUESTION #8
What other types of information did you find essential to maintaining your "feel" for the health of your operation?

RESPONDENT #13 - "Identify by NSN the item with the most frequent demands and/or backorders that cause MICAP conditions - see if this correlates with your SORTS reports (source - QLP)".

RESPONDENT #14 - "Receiving line status (daily walk through). Contracting interface (weekly/monthly meetings). Retail sales stockage (weekly walk through/QLP). Excess program status. Fuels status (equip, product balances, outstanding workorders).

RESPONDENT #15 - "Daily consumption rates for LOX, LIN, deicer, Jet, Diesel, Mogas. Equipment/facilities status. LFM schedules."

RESPONDENT #16 - "Weekly staff meetings - get a feel from your supervisors as compared to a personal feel from visits around the areas - find people you can trust and let them be your eyes and ears."

RESPONDENT #19 - "see question #10 (my decision to put this under tips)"

RESPONDENT #20 - "I went to MICAP, SSC and POL everyday".

RESPONDENT #21 - "Personal contact with people in the squadron - but you don't get that from a PC."

RESPONDENT #22 - "Who complained and why. If no complaints, account running OK."

RESPONDENT #23 - "TNMCS rates, by month and weapon system for the last two years for my base and all others having the same weapon systems. Cause codes for MICAPS for last 12 months, i.e., A, B, & H for A-10, C-130."

QUESTION #9
Describe any other situation/challenge/problem you experienced, what caused it and what steps you took to successfully correct it. What did you learn from this experience?

RESPONDENT #13 - "Lost requisitions. Duplicate requisitions - need to have stock control validate high cost requisitions with the source of supply - things like dorm furniture, CWDE, etc."

RESPONDENT #14 - "Bench stock rates too low - many NSNs had no levels to support the bench stock authorization. (Reviewed with customer - loaded some special levels - deleted some authorizations).

RESPONDENT #15 - "Tank truck receipts on heavy fly days caused problems due to poor manning. Track receipts with flying schedule. Work with DFSC on scheduled down pipeline time."

QUESTION #10
Please provide any advice, "tips", things to avoid or ideas that worked for you.

RESPONDENT #1 -
"1. Make your computer support period match your customers busiest time!

2. Don't stock JBD items that require a drawing - something's wrong.

3. Review items that you have stocked in several places and see if centralized storage/management might not be better.

4. Remember - you can't reverse post an inventory entry. So be careful with them!"

RESPONDENT #2 -
"1. Have your warehouse personnel do daily inventories with the goal of doing the entire stock in the space of a year. This not only improves accuracy, but warehouse practices, excess management, etc.

2. Establish a customer pick-up point in the main warehouse, or where it makes sense, (other than the flightline parts store) for those customers who are in a hurry and don't want to wait for delivery.

3. Consider using civilian overhires to help with dormitory self-help. Big morale boost for the dorm troops.

4. Appoint "crew chiefs" for sections of the warehouse. Make them responsible for cleanliness, accuracy, storage practices, etc.

5. Gather data (during in processing) on where your people have worked in base level supply. Useful for last minute TDY taskings, etc.

6. Keep your MRSP ready for deployment and run DMAS daily so that you always know the status of your kits.

7. Benchmark your key indicators against a base with a like weapon system, then compare your stats to theirs. Wherever they are better, call them and find out why.

RESPONDENT #8 -

"1. Consider a daily, 15 minute COS "standup" to hear feedback on critical areas.

2. Collocate demand processing, research and MICAP.

3. Training is the key - know who is and who isn't - train the ones that need it."

RESPONDENT #9 -

"1. Hold monthly "chalk talks" with key sections to ensure they understand your philosophy, what you expect of them and what their wartime tasking is.

RESPONDENT #10 - "Go where you feel the most uncomfortable."

RESPONDENT #11 -

"1. Walk through the warehouse and randomly select items for inquiries, etc.

2. Always personally inbrief the newcomers - don't delegate.

3. Consider holding a personal welcome of some sort for your newcomers. (One COS, every two months, invited all newcomers to the house for a simple dinner).

4. Develop some sort of "on the spot" recognition program. (one COS carried one day pass authorizations and would hand them out when something special warranted it).

5. Develop some way to get informal feedback from the lowest levels. (Many COS' advocate management by wandering around - MBWA, where you solicit feedback, then talk to management about what you discover).

6. Develop "group" recognition programs in addition to the personal ones.

7. Consider weekly flight "standups" where the younger troops are encouraged to participate - tell everyone what their job is for example."

8. Step up and take the lead on wing projects - be known as part of the solution, not part of the problem.

RESPONDENT #13 -

"1. Hold "working lunches" where your key staff are invited, but not required to attend a lunch with you and discuss business in an informal atmosphere.

2. Hold daily squadron "stand ups" to promote communication and "socialization" among you key staff.

3. Social functions with key personnel.

4. Assign good people to the sections that interface with your customers. (IEU, Customer Service, Training, Pickup and Delivery). These are your ambassadors. Make sure they know and understand your desires. Positive attitudes go a long way to improving customer support.

5. Run DMAS weekly - get the top 20. Then get your top 20 MICAP items and your top 20 $$ value DIFM assets. Run periodic inquiries on all of these to determine status and review cause codes.

6. Identify high demand items that cause backorders/MICAPS. Compare to your SORTS top 20, identify seasonal items, identify cyclical items, identify changes in maintenance philosophy.

RESPONDENT #14 -
"--I walk the receiving line daily and have the MICAP troops work closely with stock control for multiple hit items.
--Get a close relationship with the customers. Get the BDUs on and be visible in Maintenance.
--Develop partnership with Contracting - their buys can eat your lunch.
--Have your people ID what tools they need and fight for funding - PCs, furniture, lifts, vehicles, mowers, etc.
--Serialized control for weapons and COMSEC - procedures/reporting.
--Learn the money side of your business.
--Visit the depots - especially your prime weapon systems support.
--Go for 100% issue effectiveness in your high demand items and take your chances on the slower items."

RESPONDENT #15 - "Avoid getting mired in details when there is no problem - let the POC handle the details unless they ask for help. Keep up with your status from transportation on vehicle location."

2. Continuity books - insist on them in key areas.

3. Mandatory monthly activity reports from each flight.

4. Do an annual history - you'll be glad you did."

RESPONDENT #16 - "find people you can trust and let them be your eyes and ears." (My interpretation of the answer to # 8). Hold a "mini How Goes It" at a weekly staff meeting. - (one subject/15 min) - promotes self confidence.

RESPONDENT #19 -
"1. Let your folks develop indicators for their sections and monitor them on a monthly basis. This gives everyone a "stake" in the account.
2. Customer service area is key to what's going on. Look at what is going on.
3. Put your best people in analysis and use them.
4. Keep close to your fuels accountants.
5. Set high goals and help your folks reach them.
6. Insure a clean line concept is established in receiving.
7. Wander throughout the account to see what folks are doing.
8. Encourage the use of small computers to make the job easier."

RESPONDENT #20 -
"1. Be in charge - don't let someone else run your squadron (JA, etc)
2. Be a time manager - don't get chained to the paper and your desk.
3. Know your people.
4. If an asset goes on record today, it goes to warehouse location today.
5. Never defer aircraft bench stock buys - you just reduce sales.
6. Understand and support Fuels.
7. Get your Top 3 behind you.
8. Understand in detail, your wing repair cycle.
9. Meet with your customers in their work place.
10. Keep maintenance honest - have a CAMS terminal in MICAP."

RESPONDENT #21 - "Don't micro-manage. Give people the flexibility to perform their jobs the best they see fit - which may not be the way you would do it - but if the end result is the same, who cares? I've seen some mighty frustrated people as the result of a supervisor telling them "how" to do the job versus "do" the job.
The COS should have a daily MICAP and daily fuels briefing. The MICAP briefing should include a review of not only status, but cause codes. He should also look at TNMCS rates on a daily basis, the flying schedule, etc., to make sure your maintenance brother is playing it straight - even the best sometimes don't. As for fuels, you need to know how they are doing on response times, equipment status, etc."

RESPONDENT #22 - "I made people responsible and accountable for their own areas. I "checked" on them by making them explain what they do, and what happened after they did it. Inquiry classes for training. Taught them the partnership of the Air Force - more of a fraternity then a job."

RESPONDENT #23 -
"1. Do a tour at MAJCOM in weapon system support or RSP management to get a view of AFMC non-support. At company grade level (base), visit an ALC to see what an IM does, talk to one and learn how untrained they are, overworked they are, and listen to AFMC jargon & bureaucratic B.S. of the GM 15's as they tell you they are "only funded for ___% of the requirement", "repair only for MICAPS, not for stock", etc.

2. Manage people, not statistics. One LG and Wing Commander I had was always asking what we were doing about the terrible TNMCS rates for the month - based on 2-3 days worth of data!

3. Educate your LG in supply stats. One LG I had never could comprehend the difference between stock fund and O&M $$."

GENERAL:

(Resist the temptation to get into the "details" of everything just because it's something you like or know and think you are good at. You don't have time and you have a staff to do that. Get involved only when a true need exists.)

(Another "feedback" idea is to hold 15 minute "in place breaks" in the various duty sections where you tell them something about the wing/squadron and ask them for input on their concerns/questions.)

APPENDIX SIX
(SUMMARY OF "TIPS" FROM INTERVIEWS AND SURVEYS)

The following tips and advice were gathered through interviews with and responses to a printed questionnaire by selected Air Force supply professionals. This group included active duty and retired, military and civilians, and officers and enlisted personnel from a wide variety of backgrounds and experiences. A total of 23 supply people contributed to this attempt to capture for the future the ideas and thoughts of people who have "been there, done that".

These thoughts are not presented in any priority order; however, an attempt has been made to "group" similar ideas or subjects.

Staff Meetings, Stand-ups, etc

1. Consider a daily, 15 minute Chief of Supply stand-up to get feedback on critical areas.
2. Hold daily squadron stand-ups to promote communication and socialization among your key staff.
3. The COS should have a daily MICAP and a daily Fuels briefing.
4. Hold monthly "chalk talks" with key sections to ensure they understand your philosophy, what you expect of them and what their wartime tasking is.
5. Consider weekly Flight stand-ups where the younger troops are encouraged to participate - tell everyone what their job is, for example.
6. Hold a mini "How Goes It" at a weekly staff meeting. (One subject - 15 minutes)
7. Hold "working lunches" where your key staff are invited, but not required, to attend a lunch with you to discuss business in an informal atmosphere.
8. Conduct 15 minute, "in-place breaks" in various duty sections where you tell them something about the wing/squadron and ask for feedback from them.

Personnel

1. Consider using civilian overhires for some dormitory self-help. Big morale boost for the dorm troops.
2. Gather data (at in-processing) on where your people have worked in base supply. Helpful during contingencies, last minute taskings, etc.
3. Training is the key - know who is and who isn't - train the ones that need it.
4. Always personally brief the newcomers - don't delegate.
5. Consider holding some sort of personal welcome for your newcomers. (One COS invited them all over to his/her residence once a quarter).
6. Develop an "on-the-spot" recognition program. (One COS carried one day passes and gave them out when warranted).
7. Develop "group" recognition programs in addition to the individual ones.
8. Hold periodic social functions with your key personnel.
9. Wander throughout the account to see what folks are doing.
10. Know your people.
11. Manage people, not statistics.

Leadership/Management

1. Develop some way to get informal feedback from the lowest levels. (Many COS' advocate management by wandering around - MBWA)

2. Step up and take the lead on Wing projects - be known as part of the solution, not the problem.
3. Find people you trust and let them be your eyes and ears.
4. Avoid getting mired in details when there is no problem - let the POC handle the details unless they ask for help.
5. Resist the temptation to get into the details of everything just because it's something you like or think you are good at. Get involved only when a true need exists.
6. Make people responsible and accountable for their own areas. Ask them to explain what they are doing.
7. Don't micro-manage. Give people the flexibility to perform their jobs the best they see fit - which may not be the way you would do it - but if the end result is the same, who cares?
8. Get your Top 3 behind you.
9. Be in charge - don't let someone else run your squadron (JA, SP, etc)
10. Set high goals and help your folks achieve them.
11. Be a time manager - don't get chained to the paper and your desk.
12. Go where you feel the most uncomfortable. (i.e., stock fund, fuels, etc)

Customer Support

1. Establish a customer pick-up point in the main warehouse, or where it makes sense, for those customers who are in a hurry and don't want to wait for delivery.
2. Assign good people to the sections that interface with your customers. (IEU, Customer Service, Training, Pickup and Delivery). These are your ambassadors.
3. Get a close relationship with the customers. Get the BDUs on and be visible in Maintenance.
4. Customer service area is the key to what is going on. Look at what is going on.
5. Meet with your customers in their workplace.

Account Management - General

1. Continuity books - insist on them in key areas.
2. Mandatory monthly activity reports from each flight.
3. Do an annual history - you'll be glad you did.
4. Let your folks develop indicators for their sections and monitor them on a monthly basis. This gives everyone a "stake" in the account.
5. Put your best people in analysis and use them.
6. Keep close to your fuels accountants.
7. Encourage the use of small computers to make the job easier.
8. Understand and support Fuels.
9. Develop partnership with Contracting - their buys can eat your lunch.
10. Have your people identify the tools they need and fight for funding - PCs, furniture, lifts, vehicles.
11. Learn the money side of your business.
12. Visit the depots - especially your prime weapon system support.
13. Educate your LG in supply statistics.
14. At company grade level, visit an ALC to see what an IM does, talk to one and learn how untrained they are, how overworked they are.

Account Management - Specific

1. Don't stock JBD items that require a drawing - something's wrong.
2. Review items that are stocked in more than one place to see if you can't consolidate.
3. Remember - you can not reverse post an inventory transaction. So be careful.

4. Have your warehouse personnel do daily inventories with the goal of doing the entire account once a year.
5. Appoint "crew chiefs" for sections of the warehouse. Make them responsible for cleanliness, accuracy, storage practices, etc.
6. Benchmark your key indicators against a base with a like weapon system - compare your statistics - if they are better, find out why.
7. Keep your MRSP ready for deployment - run DMAS daily.
8. Collocate demand processing, research and MICAP.
9. Walk through the warehouse periodically and randomly select items for inquiries.
10. Run DMAS weekly - get your top 20. Then get your top 20 MICAP items and your top 20 $$ value DIFM assets. Run inquiries, determine status, review cause codes.
11. Identify high demand items that cause backorders/MICAPS. Compare to your SORTS top 20, identify seasonal and cyclical items, identify changes in maintenance philosophy.
12. Walk the receiving line daily.
13. Make sure MICAP troops work closely with stock control on multiple hit items.
14. Go for 100% issue effectiveness on your high demand items and take your chances on the slower items.
15. Understand the procedures/reporting for COMSEC and serialized items like weapons.
16. Insure a clean line concept is established in receiving.
17. If an asset goes on record today, it goes to the warehouse location today.
18. Never defer bench stock buys - you just reduce sales.
19. Keep maintenance honest - have a CAMS terminal in MICAP.

General

Do a tour at a MAJCOM in weapon system support or RSP management.

APPENDIX SEVEN
(STOCKAGE EFFECTIVENESS)

This Appendix was developed from interviews with experts in the supply-unique discipline called "stock control". The narrative that follows was developed for insertion in the expert help section of the COS-Mate for proof of concept. Similar data will be required for all performance indicators in the fully-developed system.

DEFINITIONS

A. Stockage Effectiveness: Stockage effectiveness measures how well you are providing support to your customer(s) for those items you are authorized to stock - either through demand based levels or special/adjusted levels. This measure is primarily a reflection of how well you are managing your supply operation, without "penalizing" you for orders for items you are not authorized to stock or that you have decided not to stock for some reason. That is why you will notice in the formula that "4W backorders" are subtracted before computing stockage effectiveness. 4W is a code that identifies those backorders for items you are not authorized to stock. Subtracting these makes the stockage effectiveness calculation a true measure of how well your inventory management and stock control skills keep on hand the items you are authorized to stock.

B. Line Item and Unit: Stockage effectiveness is computed for both line items (L/I) and units.

> **Line Item** - Each individual stock numbered or part numbered item is a line item. A tennis racket is a line item.
> **Unit** - A unit is one each of a particular item. In other words, a customer could order six **units** of one **line item** - say six tennis rackets.

>> Unit stockage effectiveness: measures the percentage of the total units requested that you were able to issue.
>> Line item stockage effectiveness: measures the percentage of the total separate line items requested that you were able to issue some or all of.

For example, looking at an EOQ or consumable item (also called XB3):

Item	Units Requested	Units Issued
Bolt	200	150
Screw	300	0
Washer	100	100
Pin	100	50
	700	300

Here, the unit stockage effectiveness would be 43% (you issued 300 of the 700 units requested), but the line item stockage effectiveness would be 75% (you made issues on 3 of the 4 line items requested).

Looking at a repair cycle item or repairable (also called XD2 or XF3):

Item	Units Requested	Units Issued
F16 Radar	1	0
F16 Antenna	1	0
Circuit card	1	1
F15 Canopy	1	1
	4	2

In this example, the overall repair cycle <u>unit</u> stockage effectiveness would be 50% (you issued 2 of the 4 units requested). The overall <u>line item</u> stockage effectiveness would also be 50% (you made at least a partial issue on 2 of the 4 line items requested).

Since repair cycle items are generally issued in quantities of one each, there is little difference between repair cycle line item and unit SE. EOQ or consumable items can experience large differences.

In spite of these characteristics (or because of them) we normally focus on the <u>line item stockage effectiveness</u> as being representative of our level of support effectiveness.

CALCULATION

Unit Stockage Effectiveness:

$$\frac{\text{\# of units issued}}{\text{\# of units issued} + \text{\# of units backordered} - \text{\# of units backordered 4W}}$$

Line Item Stockage Effectiveness:

$$\frac{\text{\# of line items issued}}{\text{\# of line items issued} + \text{\# of line items backordered} - \text{\# of line items backordered 4W}}$$

(NOTE: 4W is a code that identifies a backorder for an item that you are not authorized to stock - you have no stock level or reorder point. For an explanation of why these are subtracted, see the definitions.)

ANALYSIS

A. <u>Background:</u> Stockage effectiveness is not normally analyzed overall (i.e., all ERRCs added together) because of the differences between repair cycle and EOQ items. It is normally analyzed as:

> Repair Cycle Unit Stockage Effectiveness
> "   "   Line Item "   "
> EOQ Unit Stockage Effectiveness
> " Line Item "   "

B. <u>Trend Analysis:</u>

Backorders are the key to researching poor stockage effectiveness. These tell you what is being ordered that you don not have and must backorder for your customers.

In order to investigate a negative trend or simply a significant one-day change to the stockage effectiveness for the month to date you should follow a series of steps similar to these:

1. Using D14 data, determine if the problem can be isolated to one particular organization, weapon system or commodity. (I.e., did the SE drop for the F15, or the F100 engine? Did the drop occur in maintenance or civil engineers or vehicle maintenance, etc?). This allows you to focus on conditions present in that organization that may explain their requests (a special project or a new supply representative that needs training, etc), or situations with the weapon system that do the same (such as a modification or a time compliance technical order (TCTO)).

2. Identify the specific stock numbers (items) that experienced a large number of non 4W backorders, thereby driving the stockage effectiveness down. These items can be identified by analyzing the backorders from the previous day, or the period you are analyzing using the dueout document information. Once you have identified the items that appear to be driving SE down, you can examine:

    - types of items to see if, for example, the problem item backorders were all local purchase items.

    - "mark for" field to see if there were any unexplained multiple orders for a specific item for the same aircraft, or to see if the drop in stockage effectiveness is all due to orders from one specific shop. (It is unusual, but not impossible, for a multiple orders for the same item to be against the same tail number aircraft. This may indicate erroneous orders that will be canceled later.)

    - cancellations on the same day for the items in question. (If you see that most of the orders were canceled, then investigate why. It won't help your effectiveness rate because cancellations are not "backed out", but you at least have an explanation.)

    - cause codes to determine the source of the majority of your backorders. (Cause codes A & B are not applicable here, but do play a role in issue effectiveness.) Thoroughly investigate H, J and K occurrences.

    - reparables due in from maintenance (DIFM) to see if any organizations are holding onto reparables and not turning them in for some reason? (The computer will not reorder for stock until the reparable item is turned in because the computer treats the DIFM as a base asset applied against the authorized level. This is an education issue that you must address with your customers.)

    - due ins and status for the items to see why you didn't have the stock you are authorized.

    - if you determine that you have a problem with resupply, determine which source is the culprit. (Is it an AFMC depot or DLA, local purchase, etc?)

    - exception codes to see if any are loaded for the items in question that would affect replenishment. (Look for requisition exception (REX) codes 3 or 4)

    - computer operations that generate and transceive your requisitions (SIFS, releveling, follow-up, etc). (This is **extremely** important to the health of your operation. The Air Force Supply System has experienced serious problems with this system in the past. You must track it closely).

    - your Material Acquisition and Control Record (MACR) to see if there are constraints loaded that might explain the poor stockage for the items in question. (MACR only applies to consumable/EOQ items. You should always know what your MACR settings are.)

    - your receiving section to see if there are significant processing backlogs or large numbers of old rejects. (This would delay property being added to the item record and being available for issue.

This will require someone physically checking the receiving area as well as examining the reject list.)

- any computer system discrepancy reports (DIREPS) that could be affecting your requisitioning? (Make sure your computer folks know what is broke and the impact).

C. Corrective Actions:

1. If the problem is one or more customers, you meet with the folks in charge and find out what is driving their ordering behavior and attempt to deal with it. For example, if they have recently received a new piece of equipment, perhaps there is an initial spares support list (ISSL) you can order and load. If they have a large number of cancellations, perhaps there is a need for additional training.

2. If the problem is with one of your sources of supply (cause code H), you ensure that the classic actions are being taken, including message and telephone follow-up. You may have to get personally involved by elevating the level of interest at the source of supply.

3. If the problem is internal to your operation (cause codes J and K),) you must isolate the area(s) (computer operations, receiving, stock control) and determine if the sections need more training, more resources (people), relief from artificial constraints, etc.

RELATED INDICATORS

ISSUE EFFECTIVENESS :

You could have a very high stockage effectiveness and still not be supporting your customer(s). Because of this, you must also monitor issue effectiveness. Issue effectiveness is a measure of how well you are supporting ALL customer requests (the 4Ws are not removed) and may be an indication of how proactive and aggressive you are in determining what you are authorized to stock - i.e., are you keeping your requirements computation current and accurate and are you aggressively managing your adjusted levels to have authorized levels (and stock) for the things your customers need. The only way to keep your Issue Effectiveness high is to minimize the number of customer requests for items you do not stock for some reason. Or, put another way, to stock the things your customers need. Of course, as mentioned above, there may be real-world limitations on what you can stock (stock fund ratio, adjusted levels policy, etc). If this is the reason your issue effectiveness is low, you must know it and either be able to explain it or be able to fix it.

Issue Effectiveness is computed:

$$\frac{\#units/line\ items\ issued}{\#units/line\ items\ issued + \#units/line\ items\ backordered}$$

Some may argue that issue effectiveness is a more accurate portrayal of your support to your customers and that unit effectiveness is more accurate than line item effectiveness. The bottom line is all of these indicators tell you something about your supply operation that is pertinent and important and you should track them all.

INVENTORY EXCESS

STOCK FUND RATIO

AFM 67-1 REFERENCES

SHORT FORM CHECKLIST

Investigating a negative trend:

1. Isolate the problem to a particular organization, commodity, weapon system, etc.

2. Identify the specific NSNs that are being backordered. Look for:

    - are all the items local purchase?

    - are there unexplained multiple orders for the same line item? From the same organization?
    - are there cancellations for the same item(s)?

    - are there any DIFM not being completed in a timely manner?

    - due ins and status to determine why you don't have your authorized stock.

    - which source of supply is the culprit?

    - are there any exception codes affecting resupply of the items in question?

    - are SIFS and releveling being accomplished on schedule?

    - is the MACR affecting replenishment of the items in question?

    - any significant backlogs or old rejects in receiving?

    - any DIREPS affecting requisitioning, follow-up, etc?

Backorders are the key - what is being ordered that you don't have and why?

GOAL/ACCEPTABLE RANGE

Acceptable levels (percentages) of stockage effectiveness have been developed through a combination of policy as expressed in base level supply requirements computations and experience of the various Air Force base supply operations. Inventory management policy does not attempt to achieve 100% effectiveness (satisfying every customer request by an issue from stock). Rather, that policy recognizes 100% effectiveness is an inefficient goal which is not cost effective. Significantly deviating from these levels, low or high, is generally a sign something has gone wrong in your normal supply operations.

IMPACT

The impact of falling below the acceptable performance level is generally more unhappy customers because the instances where you issue from stock what they request are decreasing. However, it is entirely possible to have an overall unacceptable stockage effectiveness and still support the primary wing mission. That is because the stockage effectiveness of individual items can vary greatly. You may in fact have a 100% stockage effectiveness for your primary weapon system. But, this typically is achieved at the expense of some other commodity/customer which drives your overall stockage effectiveness to something less than 100%.

The impact of exceeding the acceptable performance level is you may be out of tolerance in other areas like excesses and stock fund ratio. The performance level is set to achieve a balance between important areas of supply operations. You may be achieving a short-term success only to experience severe support problems later when you run out of obligation authority or exceed inventory levels.

APPENDIX EIGHT
(ISSUE EFFECTIVENESS)

This Appendix was developed from the expert interviews. It is provided for future use in the Phase II DSS.

DEFINITIONS

A. <u>Issue Effectiveness:</u> Issue effectiveness measures how well you support your customers for all requirements, regardless of whether or not you have authorized stock levels for the items they order. It is an indication of how proactive and aggressive you are in influencing what you are authorized to stock - i.e., are you keeping your requirements computation current and accurate and aggressively using adjusted levels to ensure you stock the things your customers need? There may be factors beyond your control limiting what you can stock (policy, stock fund ratio, etc). If these factors are affecting your issue effectiveness, you must know it and be able to explain it or fix it.

B. <u>Line Item:</u> Each individual stock numbered or part numbered item is a line item. For example, a tennis racket is a line item.

C. <u>Unit:</u> A unit is one each of a line item. In other words, a customer may order six units of a line item - say six tennis rackets.

D. <u>Unit Issue Effectiveness:</u> Measures the percentage of the total units requested that you were able to issue.

E. <u>Line Item Issue Effectiveness:</u> Measures the percentage of the total separate line items requested that you were able to issue at least some or all of.

Examples
Looking at an EOQ or consumable item (also called XB3):

Item	Units Requested	Units Issued
Bolt	200	150
Screw	300	0
Washer	100	100
Pin	100	50
	700	300

In this example, the unit issue effectiveness would be 43%, (you issued 300 of the 700 units requested), but the line item issue effectiveness would be 75% (you made at least a partial issue on 3 of the 4 line items requested).

Looking a repair cycle or repairable items (also called XD2 and XF3):

Item	Units Requested	Units Issued
Radar	1	1
Antenna	1	0
Circuit Card	1	0
Canopy	1	1
	4	2

In this example, the overall unit issue effectiveness would be 50% (you issued 2 of the 4 units requested). The overall line item issue effectiveness would also be 50% (you issued at least part of 2 of the 4 line items requested).

Repair cycle items, particularly XD2, are generally issued in quantities of 1 each.

CALCULATION

Unit Issue Effectiveness:
$$\frac{\text{\# of units requested}}{\text{\# of units issued} + \text{\# of units backordered}}$$

Line Item Issue Effectiveness:
$$\frac{\text{\# of line items requested}}{\text{\# of line items requested} + \text{\# of line items backordered}}$$

ANALYSIS

A. Background: Issue effectiveness is not normally analyzed as an overall figure (i.e., all consumable and repairable items added together). It is normally analyzed as:

        Repair Cycle (XD2/XF3) Unit Issue Effectiveness
        "   "   " Line Item Issue Effectiveness
        EOQ (XB3) Unit Issue Effectiveness
        "   " Line Item Issue Effectiveness

B. Trend Analysis:

You should monitor Issue and Stockage Effectiveness together. Stockage effectiveness is a sub-set of issue effectiveness. (Remember, stockage effectiveness is nothing more than issue effectiveness with the 4W backorders removed). Poor stockage effectiveness impacts issue effectiveness, but the reverse is not true. Poor issue effectiveness does not necessarily mean poor stockage effectiveness.

Backorders are the key to researching poor issue effectiveness. You must know what your customers order that you do not have in stock, but especially what they order that you do not even have authorization to stock.

For the purposes of this explanation, we assume that your stockage effectiveness is satisfactory. (If it is not and you need help analyzing it, see the expert help on stockage effectiveness). Therefore, you must concentrate on those items your customers order that you do not have authority to stock.

The steps you follow are similar to those used to investigate stockage effectiveness trends:

1. Determine if the problem can be isolated to one particular organization, weapon system or commodity (i.e., did the issue effectiveness drop for the F15, or the F100 engine? Did the drop occur in maintenance or civil engineers or vehicle maintenance, etc?). This allows you to focus on conditions present in the organization that may explain their requests (a special project or a new supply representative that needs training, etc), or situations with the weapon system that do the same (such as a modification or a time compliance technical order (TCTO)). This information is available from the D14 or the daily transactions.

2. Identify specific stock numbers (items) that you do not have stock levels on that experienced a large number of backorders, thereby driving the issue effectiveness down. These items are identified by analyzing the backorders from the previous day, or the period you are analyzing using the dueout document information. Once you have identified the items that appear to be driving issue effectiveness down, you can examine the:

> - types of items to see if, for example, the problem item backorders were all local purchase items.
>
> - "mark for" field to see if there were any unexplained multiple orders for a specific item for the same aircraft, or to see if the drop in issue effectiveness is all due to orders from one specific shop. (It is unusual, but not impossible, for a multiple orders for the same item to be against the same tail number aircraft. This may indicate erroneous orders that will be canceled later.)
>
> - cause codes, especially A & B, to determine if you should make a decision to stock items that you currently do not stock.
>
> - cancellations on the same day for the items in question. (If you see that most of the orders were canceled, then investigate why. It will not help your effectiveness rate because cancellations are not "backed out", but you at least have an explanation.)
>
> - your receiving section to see if there are significant processing backlogs or large numbers of old rejects. (This would delay property being added to the item record and being available for issue. This will require someone physically checking the receiving area as well as examining the reject list.)
>
> - attempt to determine why you do not have stock levels for the items in question. (funding, policy, etc)
>
> - check to see that file status is being performed properly. (this is the only time you get a computed level - during file status)

C. Corrective Actions:

1. If the problem is one or more customers, you meet with the folks in charge and find what is driving their ordering behavior and attempt to deal with it. For example, if they have recently received a new piece of equipment, perhaps there is an initial spares support list (ISSL) you can order and load. If they have a large number of cancellations, perhaps there is a need for additional training.

2. If the problem is internal to your operation (stock control) you must isolate the area(s) and determine if the sections need more training, more resources (people), relief from artificial constraints, etc.

3. Educate customers on the need for and the uses of adjusted levels.

4. Review EOQ backorders for possible addition to one or more bench stocks.

RELATED INDICATORS

STOCKAGE EFFECTIVENESS:

Stockage effectiveness measures how well you support your customers for those items you are authorized to stock. Stockage effectiveness removes from the calculation those backorders for items with no authorized stock level (sometimes referred to as "4W" - a code that identifies these backorders for the computer). Stockage effectiveness measures how well your inventory management and stock control skills keep on hand your authorized stock.

Calculation:

$$\frac{\text{\# line items/units requested}}{\text{\# line items/units requested} + \text{\# line items/units backordered} - \text{\# line items/units backordered code 4W}}$$

AFM 67-1 REFERENCES

SHORT FORM CHECKLIST

Investigating a negative trend:

1. Isolate the problem to a particular organization, commodity, weapon system, etc.

2. Identify the specific NSNs that are being backordered that have no authorized level. Look for:

- are all the items local purchase?

- are there unexplained multiple orders for the same line item? From the same organization?
- are there cancellations for the same item(s)?

- any DIREPS affecting the requirements computation?

- is file status being accomplished?

Backorders are the key - what is being ordered that you do not have (that you do not stock) and why?

GOAL/ACCEPTABLE RANGE

Acceptable levels (percentages) of issue effectiveness have been developed through a combination of policy as expressed in base level supply requirements computations and experience of the various Air Force base supply operations. Inventory management policy does not attempt to achieve 100% effectiveness (satisfying every customer request by an issue from stock). Rather, that policy recognizes 100% effectiveness is an inefficient goal which is not cost effective. Significantly deviating from these levels, low or high, is generally a sign something has gone wrong in your normal supply operations.

IMPACT

The impact of falling below the acceptable performance level is generally more unhappy customers because the instances where you issue from stock what they request are decreasing. However, it is entirely possible to have an overall unacceptable issue effectiveness and still support the primary wing mission.

That is because the issue effectiveness of individual items can vary greatly. You may in fact have a 100% issue effectiveness for your primary weapon system. But, this typically is achieved at the expense of some other commodity/customer which drives your overall issue effectiveness to something less than 100%.

The impact of exceeding the acceptable performance level is you may be out of tolerance in other areas like excesses and stock fund ratio. The performance level is set to achieve a balance between important areas of supply operations. You may be achieving a short-term success only to experience severe support problems later when you run out of obligation authority or exceed inventory levels.

APPENDIX NINE
(COTS Evaluation Findings)

This Appendix outlines the significant findings for each COTS tool evaluated. Most of the tools functioned as advertised making selection difficult. Additionally, when we discussed shortcomings with the manufacturers, they assured us they were addressing those shortcomings in their next release due out at any time. This manufacturer's attitude caused us to base our findings only on what was immediately available on the market at the time of this report. Additionally, we only considered any upgrades if the manufacturer was willing to provide us a beta version of the tool.

Access

Development Qualities
Access provides a easy to learn relational database environment. It also provides many of the tools necessary to develop a graphical user interface for the data system. Access has many Wizards which aid in development and may assist the end-user in building ad hoc SQL queries, data entry forms and other user interface screens.

Deployment Qualities
The database seems to be limited to smaller data applications. Several users have used Access for applications as large as 1 gigabyte. However, our experience shows that these larger files need to be broken into smaller manageable sections for Access to be successful. When we started using files larger than a few megabytes we encountered random failures. Although these failures could be corrected, it increased the time of development. The vision of COS-Mate appears to have a large data requirement. This may be a problem for Access in future deployment. This is one reason for the discussions of putting a relational database on the mainframe.

Vender Support
Access is supported by Microsoft Technical Support. Even without a technical support contract we found them extremely helpful. The only drawback was sometimes the help line was busy. However, they returned our calls within a few hours.

Cost
Best available cost for the stand-alone application is $99, although most retailers sell it for $139.99. Cost for the Developer's Toolkit is approximately $895. With the purchase of the developer's kit, executables can be distributed free. These executables are limited in application but adequately satisfy the needs of COS-Mate.

Conclusion
For the initial application of COS-Mate, Access is an excellent tool. It provides the interfaces necessary at a reasonable cost. As the use of COS-Mate grows other database applications may be necessary to handle the robust amount of data. On the other hand, Microsoft may upgrade Access to keep up with the growth.

FolioViews

Development Qualities
FolioViews offers a variety of hypertext utilities that serve the purposes required within COS-Mate. It is rather easy to learn and does not extensive training to master basic skills. The built-in tutorials are well

done but limited. It integrates with a variety of Windows products using standard dynamic link capabilities.

Deployment Qualities

FolioViews appears portable, although it has a rather lengthy install process. Two users complained of it causing problems upon installation, but the manufacturer claims this is not a frequent problem. FolioViews provides a simple system for viewing hypertext and a robust system for developing hypertext. It clearly meets the needs for COS-Mate development.

Vender Support

The vender support is above normal. They provided data without hesitation. They have recently seen significant growth in their clients and are admittedly having problems keeping up their reputation for quality support. We did not require technical support. They provide periodic, although infrequent, training courses on their suite of utilities. Training is geared toward the novice or expert user.

Cost

Cost for the Developer's package is approximately $500.
Cost for a single viewer user is $45.
Cost for 5 viewer users is approximately $225.
Cost for 30 viewer users is approximately $1350.
Cost for 100 viewer users is approximately $4500.

Conclusion

FolioViews is an excellent tool for COS-Mate. The only drawback is that Standard Systems Center has chosen Guide as their hypertext tool of choice. Because of this selection Guide is the winner in hypertext tools. Otherwise both carry a high rating.

Guide

Development Qualities

Guide satisfies the requirements of the COS-Mate developer. The learning curve is shallow and training is readily available. It integrates with other products through standard dynamic links.

Deployment Qualities

Guide comes with a Viewer package which makes applications easy to port. One difficulty we had was when moving files. Guide appeared to not "remember" links. Based on information from their technical support, this could be caused by the links not being properly established in the beginning. We were not able to prove this claim. During the study period Guide was selected by Standard Systems Center as the hypertext tool of choice. Using Guide in COS-Mate makes it similar to other tools being developed.

Vender Support

Guide was originally developed by the Owl Company. They were bought out last year by InfoAccess. InfoAccess has a reputation of strong user support. Technical Support we requested from them was quick and helpful. They offer monthly training courses on their entire suite of development products. These are only offered in their Seattle offices.

Cost

Cost for the Developer's package is approximately $520. Guide also offers a suite of tools allowing additional capabilities above and beyond that required of the first iteration of COS-Mate. This complete set runs $6500.
Cost for a single viewer user is $33.

Cost for 5 viewer users is $165.
Cost for 30 viewer users is $990.
Cost for 100 viewer users is $3300.

Conclusion
Guide performs the functions required of COS-Mate. It is the tool of choice for COS-Mate since Standard Systems Center chose Guide to use for building future applications.

LightShip

Development Qualities
LightShip offers a development environment that facilitates the development of COS-Mate. It is easy to learn and does not require extensive training to master the basic skills. The built-in tutorials are helpful. It integrates with other Windows products. It provides an easy to use graphical interface for quick prototyping and faster initial development. LightShip Version 4.0 has incorporated a script language to facilitate the addition of features not available in the tools provided. The new release of Lightship Lens, expected in January, 1995, provides an interface with Access files. Developers can learn LightShip quickly, but a training class hones the skills further. Training classes are offered frequently throughout the country by both Pilot and third party contractors. We attended two training courses. The basic is very basic, but the advanced is well balanced.

Deployment Qualities
LightShip provides the best graphical interface of the products tested. LightShip allows reuse of objects in future systems. This provides a quick way to baseline an application which is then tailored to the data needs of the specific user. Tech support is above average for users and continues to improve.

Vender Support
The vender support is above normal. They provided data without hesitation. They offer reasonably priced training class on many levels for all products. Their technical support is above normal. In one instance we sent them a screen that was giving us problems, they recreated it, and offered another alternative for us which proved better than our original design. This was done within 24 hours. They provide a fax-back option for technical issues which worked well.

Cost
LightShip is available at $980.00 retail or $650.00 through the GSA schedule. They indicated they would charge that amount per license. When asked for a price for 100 licenses, they indicated they would be willing to discuss terms.
Training classes cost from $900 for three days to $1600 for a week.

Conclusion
LightShip is one of the top tools investigated. It is capable of supporting the development of the COS-Mate system.

ObjectPlus

Development Qualities
Does not provide a credible development environment for the COS-Mate tool. Our discussions with the ObjectPlus manufacturer, Spinnaker, indicated they had a PC version and a Unix version coming soon. What we uncovered was their PC version had just been released. It has many problems. Simply loading it caused the PC to lock up several times. Once we got it running, it left ghost images on the screen as we

paged through he screens. Although the methodologies in he tool appear good it simply is not mature enough to use for COS-Mate.

Deployment Qualities
The vendor provides no training. We were unable to evaluate the modification capability since we did not believe this to be a credible tool.

Vender Support
The vender support is adequate. They provided data without hesitation. They appear to be a relatively newcomer to this market. They had promised to deliver us a Beta Version of their next block upgrade, but never did.

Cost
The GSA cost of the application is $495.00. This is the same for any number. The vender indicated a willingness to negotiate on a large buy, but did not offer any numbers for consideration.
Conclusion
Because of its immaturity, ObjectPlus is not an adequate tool for the development of the COS-Mate system.

Oracle CDE

Development Qualities
Oracle has a strong integrated package of tools for the developer. They are easy to understand and learn. Oracle integrates with other tools required for COS-Mate. However, one drawback of Oracle is that it is difficult to develop on a PC. Oracle does have PC packages but the memory requirements are robust compared to other tools.

Deployment Qualities
Oracle becomes difficult to deploy because of the large memory requirements of the tool. Oracle does have significant interoperability capabilities which make it an excellent candidate if a relational database were placed on the mainframe. Surprisingly there are limited debug capabilities which means the user would rely more on technical support which is limited for the PC. Oracle is so difficult to install that some users required technical support to install the program.

Vender Support
Vender support is reportedly weak especially for PC systems. Oracle has been supporting large mainframe systems for years and has continuously rated only average in technical support. When we sought advise on PC systems twice there was no one that could "really" help us. Oracle training, however, is the best organized and most readily available. It is rather pricey, but very complete. If Oracle were used in future applications, it would probably be best to buy a maintenance agreement with them for the first year of operations.

Cost
Cost for the CDE package is approximately $3500.
Cost for a single user is $2000.
Cost for 5 users is approximately $2,000 each.
Cost for 30 users is approximately $500 each.
Cost for 100 users is approximately $350 each.

Conclusion

Oracle provides an excellent development environment for development of the Graphical user Interface and the Background Database processor. Training is readily available and good. Oracle does require large memory on each PC--much larger than normally required for a COS-Mate type system. Technical support is questionable without the investment of additional funds. Cost is high, but Oracle gives the buyer a quality product. For COS-Mate, Oracle provides too robust a system and requires users to be developers. It does not meet the desires of the Base Level System Modernization project.

Passport

Development Qualities
Although Passport provides an environment to produce GUIs, it does require additional programming to perform the same functions as other tools investigated. One developer reported repeated crashes during routine developments. There are no debugging tools. Although this is a "mature" tool it caused a PC to hang consistently upon installation.

Deployment Qualities
With extra coding requirements, Passport simply can not support a deployment of COS-Mate. Significant training is required for user modifications. No professional training is available.

Vender Support
Passport is a small company so some of the developers are on the technical support staff. This provides an excellent technical support team. There is some concern about the staff providing adequate technical support if the tool is used for a system distributed nationwide at several locations.

Cost
Passport would not offer any cost information. They prefer to work on a case by case basis.

Conclusion
Passport is not a good tool for the development and deployment of COS-Mate. Too much computer knowledge is required of the user.

PowerBuilder

Development Qualities
PowerBuilder provides DataWindow objects which allow creation of a database with little knowledge of SQL (similar to an Access Wizard). The DataWindow objects reduce the number of objects required to represent data in forms, tables, or reports, thus making the application faster. PowerBuilder is integrated with a WATCOM database tool. This integrated package provides a wide range of features. However, one developer commented on the extremely large learning curve.

Deployment Qualities
PowerBuilder was chosen by the Air Force Standard System Center as the standard for developing graphical user interface/data manipulation systems. The tool can create executable applications for delivery. One concern with PowerBuilder deployment is in the training of users for tailoring in the field. PowerBuilder does offer excellent training classes but they are long and costly. Unlike Lightship, PowerBuilder requires a specialized training class for field users.

Vender Support
The vender support is above normal. We received a in-house demo of the tools that included an explanation of the services provided and a demonstration of the software tools. They provided data

without hesitation They do provide training courses on their complete suite of utilities. Training can be geared toward the novice or the expert user.

Cost
PowerBuilder comes in two different packages. The full package that allows development of a system for deployment on a LAN is $2400 (GSA Schedule). They were not willing to give discounts for multiple developers because of their overall pricing strategy. With the purchase of the full package, a developer can develop and deploy as many PowerBuilder applications as required. They also offer a Desktop version for development of applications on a single unit. This costs $495.00 at most retail outlets. The desktop version was the one used for COS-Mate evaluation.

Conclusion
PowerBuilder is capable of performing the task. It is one of the top tools evaluated. The cost is exceptional for a COS-Mate tool. Since this tool would be distributed to, perhaps, hundreds of workstations having no license cost per workstation is an attractive feature. However, there remains a concern for training. COS-Mate requires the user in the field to modify as required. Our experience with PowerBuilder indicates this adaptability is limited without PowerSoft training.

Enterprise Team Developer (Symantec)

Development Qualities
Enterprise Team Developer provides the ability to integrate business rules at a high level (attribute level) which drive the application. The tool is ODBC compliant but may require some customization to use with Access. Enterprise Team Developer incorporates a built-in scripting language allowing the developer the flexibility to use C++ library files or call DLLs. This integrated package provides a wide range of features.

Deployment Qualities
Enterprise Team Developer can create executable applications for delivery. One concern with Enterprise Team Developer deployment is in the training of users for tailoring in the field. Enterprise Team Developer does offer training through third-party vendors. Enterprise Team Developer requires a specialized training class for field users.

Vender Support
The vender support is above normal. We received a in-house demo of the tools that included an explanation of the services provided and a demonstration of the software tools. They provided data without hesitation They do provide training courses on their complete suite of utilities. Training can be geared toward the novice or the expert user.

Cost
Pricing information was not available at the time of publication.

Conclusion
Enterprise Team Developer is capable of performing the task. It is one of the top tools evaluated. The tools ability to access diverse data is impressive. This integrated package provides a wide range of features.

Uniface

Development Qualities

Uniface is difficult to learn. Several users complained about the difficulty in learning various capabilities of the tool. Additionally, technical support was non-existent. Uniface can not be tied directly to the data source. It requires a middle tool to hold the data and update as required.

Deployment Qualities

Uniface allows reuse of specific operations. This helps with the difficult learning curve. Additionally, it appears to be very portable. The user can perform ad hoc queries simply, which is good if the user is comfortable building SQL queries. Since most users of COS-Mate may not be trained in this function, the value is questionable. Uniface has excellent migratablity to other platforms.

Vender Support

We were told that the company had a two hour call back time policy on any technical support issue. However, we were unable to get anyone in the company to call us back. We placed calls daily to their corporate offices in Massachusetts and their local sales office (which doubles as their local technical support office) for over two weeks and never received a return call. Documentation is complete for this robust tool. Training is required for a developer and classes are well done, but infrequently offered.

Cost

Cost for a developer's kit quoted is $14,000.
Cost for a single user is $5,000.
Cost for 5 users is approximately $3,000 each.
Cost for 30 users is approximately $1,000 each.
Cost for 100 users is approximately $500 each.
Note: the first Uniface person provided the above numbers. A later discussion with a different person indicated these were last year's (1993) numbers. However, they said they would stick with them since they had quoted them to us.

Conclusion

Uniface's strength is in its ability to migrate. Screens developed in a Windows environment on a PC migrate to UNIX platforms and Macintosh machines. Additionally, reverse migration is possible with minimal difficulty which increases the tools portability. However, none of these advantages outweigh the cost, the significant learning curve, and the lack of technical support. (Just because a company sets a goal for two hour support, does not mean they can meet it.) With such a high learning curve, strong technical support is a necessity.

ACRONYMS

4GL - Fourth Generation Language
ACC - Air Combat Command
ADRSS - Automated Data Reports Submission System
AF - Air Force
AFMC - Air Force Materiel Command
AIAA - American Institute of Aeronautics and Astronautics
ALC - Air Logistics Center
AMC - Air Mobility Command
API - American Petroleum Institute
AWP - Awaiting Parts
BDU - Battle Dress Uniform
BLAMES - Base Level Autodin Message Extraction System
BLSM - Base Level Systems Modernization
CAMS - Core Automated Maintenance System
CC - Commander
CDE - Cooperative Development Environment
CE - Civil Engineer
COMSEC - Communications Security
COND - Condemned
COS - Chief of Supply
COSO - Combat Oriented Supply Organization
COTS - Commercial-off-the-Shelf
CWDE - Chemical Warfare Defense Equipment
DDN - Defense Data Network
DFSC - Defense Fuels Support Center
DIFM - Due-In From Maintenance
DIREP - Discrepancy Report
DLA - Defense Logistics Agency
DLR - Depot Level Reparable
DMAS - DYNAMetric Microcomputer Assessment System
DOC - Designed Operational Capability
DOR - Due-Out Release
DPP - Deferred Payment Program
DRC - Dynamics Research Corporation
DSS - Decision support System
DUI - Driving Under the Influence
EOQ - Economic Order Quantity
EPR - Enlisted Performance Report
ERRC - Expendability, Repairability, Recoverability Code
ETIC - Estimated Time In Commission
FCC - Fuels Control Center
FMC - Fully Mission Capable
FTP - File Transfer Protocol
GSA- General Services Administration
GSD - General Support Division
GUI - Graphical User Interface
HQ - Headquarters
HQ USAF - Headquarters United States Air Force
IAD - Inventory Adjustment Detail

IEU - Individual Equipment Unit
IM - Inventory Manager
ISSL - Initial Spares Support List
JBD - Local Manufacture
LAN - Local Area Network
LFM - Liquid Fuels Maintenance
LG - Deputy Commander For Logistics
LIN - Liquid Nitrogen
LOX - Liquid Oxygen
LP - Local Purchase
MACR - Materiel Acquisition Control Record
MAJCOM - Major Command
MASS - MICAP Asset Sourcing System
MBWA - Management By Wandering Around
MC - Mission Capable
MCP - Military Construction Project
MICAP - Mission Capability
MMHS - Mechanized Material Handling System
MOGAS - Moter Gasoline
MRSP - Mobility Readiness Spares Kit
MS&D - Material Storage and Distribution
MSE - Mobility Support Equipment
MSI - Mobility Support Issue
MTC - Modern Technologies Corporation
NMCS - Not Mission Capable - Supply
NRTS - Not Repairable This Station
NSN - National Stock Number
O&M - Operations and Maintenance
OAM - On Aircraft or Missile
ODBC - Open DataBase Connectivity
OJT - On The Job Training
OPR - Officer Performance Report
ORE - Operational Readiness Evaluation
PACAF - Pacific Air Forces
PC - Personal Computer
PM - Preventive Maintenance
PME - Professional Military Education
POC - Point of Contact
PBR - Per cent Base Repair
QLP - Query Language Program
RPS - Remote Processing Station
RSD - Reparable Support Division
RSP - Readiness Spares Package
RTS - Repaired This Station
SBLC - Standard Base Level Computer
SBSS - Standard Base Supply System
SIFS - Supply Interface System
SIOATH - Source Identification and Ordering Authorization
SMALC - Sacramento Air Logistics Center
SOLE - Society of Logistics Engineers
SORTS - Status of Resources and Training
SQL - Standard Query Language
SSB - Special Separation Benefit
SSC - Standard Systems Center

SSD - Systems Support Division
TAR - Tracer Action Request
TCTO - Time Compliance Technical Order
TDY - Temporary Duty
TICARRS - Tactical Interim CAMS and REMIS Reporting System
TNMCS - Total Not Mission Capable - Supply
TNMCB - Total Not Mission Capable - Both
UTC - Unit Type Code
VIP - Very Important Person
VSI - Voluntary Separation Incentive
WAPS - Weighted Airman Performance System
WFW - Word For Windows
WRM - War Readiness Materiel

AUTHORS

Bill Shaw received his Bachelor of Business Administration in Accounting from Baylor University, Waco, Texas, in 1965. He received his Master of Science Degree in Logistics Management from the Air Force Institute of Technology, Wright Patterson AFB, Ohio, in 1972. Mr. Shaw has over 28 years experience as an Air Force Supply Officer and logistician. He completed his service as the HQ Air Force Director Supply/Fuels Policy. Mr. Shaw is a member of SOLE. He is a Senior Logistics Analyst with Dynamics Research Corporation.

Larry Reagan received his Bachelor of Science Degrees in Mechanical and Aerospace Engineering from the Illinois Institute of Technology, Chicago, IL, in 1979. He received his Master of Science in Acquisition and Contract Management from West Coast University, Santa Barbara, CA, in 1986. Mr. Reagan spent over 12 years as an Air Force officer with assignments in satellite program offices, the launch site, and the Pentagon. He is a Senior Member of AIAA and a member of SOLE. Currently employed at Dynamics Research Corporation, he is a Senior Systems Engineer designing automated decision support systems for space and logistics applications.

Robert S. Monahan received his Bachelor of Science degree in Aerospace Engineering from Virginia Polytechnic Institute and State University in 1990 and a Master of Science degree in Environmental Engineering from George Washington University in 1994. Mr. Monahan is a member of AIAA and SOLE. Mr. Monahan has published several technical papers in the area of space and launch logistics. Mr. Monahan is employed by Dynamics Research Corporation (DRC) in Arlington, VA, as a Staff Engineer, developing automated decision support systems for a variety of space and logistics applications.